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CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 358: AREAS 18, 19, 20 CELLARS/MUD PITS, NEVADA TEST SITE, NEVADA

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CLOSURE REPORT
FOR CORRECTIVE ACTION UNIT 358:
AREAS 18, 19, 20 CELLARS/MUD PITS,
NEVADA TEST SITE, NEVADA

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DISTRIBUTION LIST

ACRONYMS AND ABBREVIATIONS

BN	Bechtel Nevada
bgs	below ground surface
CAS(s)	Corrective Action Site(s)
CAU	Corrective Action Unit
COC	Contaminants of concern
cm	centimeter(s)
CR	Closure Report
CSM	Conceptual Site Model(s)
DOE/NV	U.S. Department of Energy, Nevada Operations Office
DQO	Data Quality Objectives
EPA	U.S. Environmental Protection Agency
FFACO	Federal Facility Agreement and Consent Order
ft^3	cubic feet
gal	gallon(s)
g/cm^3	grams per cubic centimeter
in	inch(es)
IT	IT Corporation
L	liter(s)
m^3	cubic meter(s)
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per Liter
µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per Liter
NAC	Nevada administrative Code
NDEP	Nevada Division of Environmental Protection
NNSA/NSO	U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office
NNSA/NV	U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office
NTS	Nevada Test Site
PCB	Polychlorinated Biphenyls
pCi/g	picocurie per gram
PRGs	Preliminary Remediation Goals

ACRONYMS AND ABBREVIATIONS (continued)

QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
SAA	Satellite Accumulation Area(s)
SAFER	Streamlined Approach for Environmental Restoration
SVOC	Semi-volatile Organic Compound(s)
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
VOC	Volatile Organic Compound(s)
yd^3	cubic yard(s)

EXECUTIVE SUMMARY

Corrective Action Unit (CAU) 358 consists of 17 Corrective Action Sites (CASs) located in Areas 2, 3, 12, 18, 19, and 20 of the Nevada Test Site (NTS). The unit is listed in Appendix III of the Federal Facility Agreement and Consent Order (FFACO) of 1996 as CAU 358: Areas 18, 19, 20 Cellars/Mud Pits. CAU 358 consists of the following CASs:

- CAS 02-99-01, Oil Stained Dirt on Concrete
- CAS 03-22-33, Bucket; Spill; Debris
- CAS 03-99-04, Spill
- CAS 12-30-02, Drill Holes
- CAS 18-09-01, Mud Pit
- CAS 19-09-05, Mud Pit
- CAS 19-09-06, Mud Pit
- CAS 19-09-07, Mud Pit
- CAS 20-09-05, Mud Pit
- CAS 20-09-08, Mud Spill
- CAS 20-23-02, Postshot Cellar
- CAS 20-23-03, Cellar
- CAS 20-23-04, Postshot Cellar
- CAS 20-23-05, Postshot Cellar
- CAS 20-23-06, Cellar
- CAS 20-37-01, Cellar & Mud Pit
- CAS 20-37-05, Cellar

The closure activities completed at CAU 358 have met the Nevada Division of Environmental Protection-approved closure standards as specified in the approved Streamlined Approach for Environmental Restoration Plan for CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office, 2003).

Based on the results for site characterization sampling, process knowledge, waste characterization sampling, and the Data Quality Objectives (Appendix A), the approved closure activities for CAU 358 were completed by: removing all impacted soil containing contaminants of concern (COC) above action levels from three CASs, by implementing administrative controls (i.e., use restrictions) at eight CASs, and by taking no further action at six CASs where no COC were present above action levels (housekeeping debris was removed from one CAS as a best management practice).

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1.0 INTRODUCTION

This Closure Report (CR) documents that the closure activities performed at Corrective Action Unit (CAU) 358: Areas 18, 19, 20 Cellars/Mud Pits, were in accordance with the Nevada Division of Environmental Protection (NDEP)-approved Streamlined Approach for Environmental Restoration (SAFER) Plan for CAU 358 (U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office [NNSA/NSO], 2003). CAU 358 as identified in the Federal Facility Agreement and Consent Order (FFACO) of 1996 consists of 17 Corrective Action Sites (CASs) located in Areas 2, 3, 12, 18, 19, and 20 of the Nevada Test Site (NTS) (Figure 1).

1.1 PURPOSE

The purpose of this CR is to document that the closure activities completed for CAU 358 met all closure standards as stated in the NDEP-approved CAU 358 SAFER Plan (NNSA/NSO, 2003). CAU 358 consists of the following 17 CASs, which are located in Areas 2, 3, 12, 18, 19, and 20 of the NTS.

- CAS 02-99-01, Oil Stained Dirt on Concrete
- CAS 03-22-33, Bucket; Spill; Debris
- CAS 03-99-04, Spill
- CAS 12-30-02, Drill Holes
- CAS 18-09-01, Mud Pit
- CAS 19-09-05, Mud Pit
- CAS 19-09-06, Mud Pit
- CAS 19-09-07, Mud Pit
- CAS 20-09-05, Mud Pit
- CAS 20-09-08, Mud Spill
- CAS 20-23-02, Postshot Cellar
- CAS 20-23-03, Cellar
- CAS 20-23-04, Postshot Cellar
- CAS 20-23-05, Postshot Cellar
- CAS 20-23-06, Cellar
- CAS 20-37-01, Cellar & Mud Pit
- CAS 20-37-05, Cellar

At the following three CASs approved closure activities consisted of excavating, removing and disposing of impacted soil/material:

- CAS 02-99-01, Oil Stained Dirt on Concrete
- CAS 03-22-33, Bucket; Spill; Debris
- CAS 03-99-04, Spill

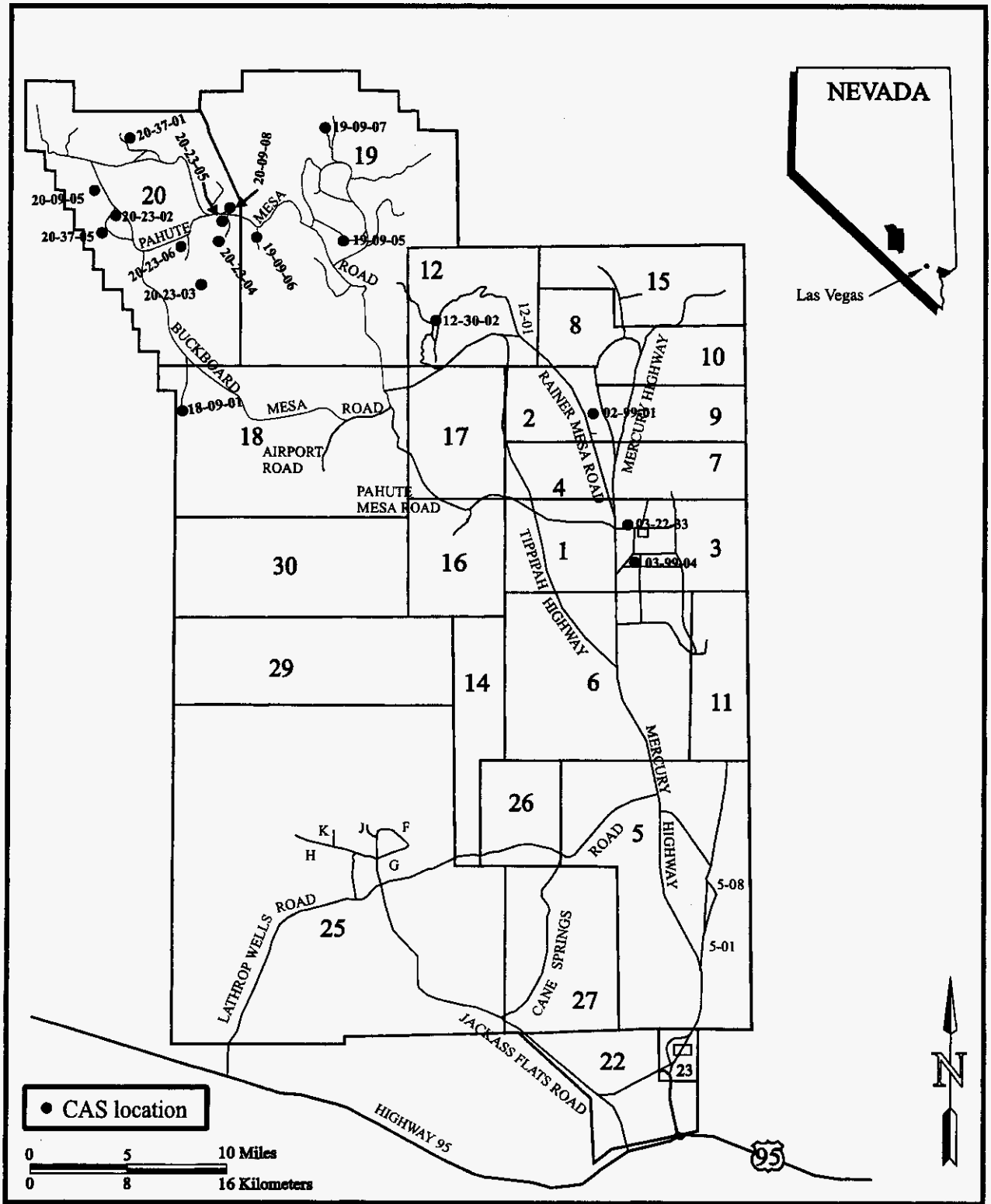

FIGURE 1
CAU 358 CORRECTIVE ACTION SITE LOCATIONS

At the following six CASs approved closure activities consisted of taking no further action. At these sites, results for previously collected characterization samples showed no contaminants of concern (COC) present above action levels (NNSA/NSO, 2003).

- CAS 12-30-02, Drill Holes
- CAS 18-09-01, Mud Pit (debris removed as best management practice)
- CAS 19-09-06, Mud Pit
- CAS 19-09-07, Mud Pit
- CAS 20-09-05, Mud Pit
- CAS 20-09-08, Mud Spill

Housekeeping debris was removed from CAS 18-09-01 as a best management practice. The housekeeping debris consisted of a bucket containing pipe dope, pieces of broken batteries, and associated soil. The bucket, pipe dope, and associated soil were hand excavated and disposed of as hazardous waste. The pieces of broken batteries and associated soil were hand excavated and disposed of as solid waste.

At the eight remaining CASs approved closure activities consisted of implementing administrative controls (i.e. use restrictions) for the postshot cellars and a mud pit.

- CAS 19-09-05, Mud Pit
- CAS 20-23-02, Postshot Cellar
- CAS 20-23-03, Cellar
- CAS 20-23-04, Postshot Cellar
- CAS 20-23-05, Postshot Cellar
- CAS 20-23-06, Cellar
- CAS 20-37-01, Cellar & Mud Pit (Cellar only, the mud pit was closed by taking no further action).
- CAS 20-37-05, Cellar

Total Petroleum Hydrocarbons (TPH) as diesel/oil was the only COC detected at levels exceeding the action level; therefore, closure activities at all of the cellars consisted of implementing administrative controls (i.e., use restrictions). These cellars were associated with postshot boreholes. Six open cellars were backfilled with clean fill on May 30 and June 10, 2003 by the Borehole Management Program after the well heads within the cellars had been extended to just above ground level. In addition to the cellars, the mud pit at CAS 19-09-05 had TPH concentrations that exceeded the action level and consequently was closed in place with administrative controls.

1.2 SCOPE

The closure strategy for CAU 358 was specified in the NDEP-approved SAFER Plan for CAU 358 (NNSA/NSO, 2003). The implemented closure strategy consisted of the following activities.

CAS 02-99-01, Oil Stained Dirt on Concrete

- "Oil stained dirt" on the concrete pad was determined to be magnetite based on process knowledge and sample analytical results (NNSA/NSO, 2003). The magnetite was removed from the concrete pad and disposed of in the NTS Area 9 U10c Landfill. Additional magnetite that had spilled over the edges of the concrete pad was also removed and disposed of at the NTS Area 9 U10c Landfill.

- TPH-impacted soil adjacent to the concrete pad was excavated and stockpiled on plastic on the concrete pad.

- Five composite soil samples were collected from the stockpiled soil and confirmed that the soil did not exhibit the characteristic of toxicity for lead above the regulatory level of 5 milligrams per liter (mg/L) (i.e. the waste was not hazardous) (U. S. Environmental Protection Agency [EPA], 2002a)

- Soil samples were collected from the bottom of the excavation to verify that clean-up levels were met. Results showed that TPH was not present in the soil at levels greater than the Nevada State Action Level of 100 milligrams per kilogram (mg/kg).

- The stockpiled TPH-impacted soil was removed from the concrete pad and disposed of in the NTS Area 6 Hydrocarbon Landfill.

- The petroleum hydrocarbon spill excavation was backfilled with clean fill to reduce a potential fall hazard from the concrete pad to the excavation.

CAS 03-22-33, Bucket; Spill; Debris

- The spill was determined to be magnetite and a magnetite-soil mixture (NNSA/NSO, 2003). The bucket was not found at the site during several site visits.

- The magnetite and magnetite-soil mixture were removed and disposed of in the NTS Area 9 U10c Landfill.

- During excavation activities, debris was found buried underneath a magnetite-soil pile. The debris included scrap metal, wood, concrete, tarpaulin, and rope. The debris and surrounding soil were removed and stockpiled on plastic for further characterization.

- Analytical results showed that the debris waste was not hazardous and could be disposed of as solid waste. The debris was removed from the site and disposed of in the NTS Area 9 U10c Landfill.

- The excavation was backfilled with soil already located on-site and an additional 30.6 cubic meters (m^3) (40 cubic yards [yd^3]) of clean fill that was transported to the site from the NTS Area 9 U10c Landfill. The site was then graded to match the surrounding topography.

CAS 03-99-04, Spill

- The epoxy tar spill was excavated and disposed of in the NTS Area 6 Hydrocarbon Landfill.
- Soil samples were collected from the excavation to verify that clean up levels were met. Results showed that TPH was not present in the soil at levels greater than the Nevada State Action Level of 100 mg/kg and that the previously identified Semi-volatile Organic Compounds (SVOCs) were not present in the soil at levels greater than the EPA Region IX Preliminary Remediation Goals (PRGs) for Industrial Soils (EPA, 2002b).
- The site was graded to match the surrounding topography.

CAS 18-09-01, Mud Pit

- The housekeeping debris, consisting of an 18.9-liter (L) (5-gallon [gal]) bucket of pipe dope with associated soil, and pieces of broken batteries with associated soil were removed from the mud pit and placed into two separate Satellite Accumulation Areas (SAAs) for storage as hazardous waste.
- Soil samples were collected from both excavated areas to verify that clean up levels were met. For the area underneath the bucket, analytical results showed that TPH was not present in the soil at levels greater than the Nevada State Action Level of 100 mg/kg and the lead concentration was not present in the soil at levels greater than the EPA Region IX PRGs for Industrial soil (EPA, 2002b). For the area beneath the broken batteries, analytical results verified that the mercury concentration was not present in the soil at levels greater than the EPA Region IX PRGs for Industrial soil (EPA, 2002b).
- A composite soil sample was collected from the SAA drum containing the broken batteries and associated soil. The sample was analyzed for Toxicity Characteristic Leaching Procedure (TCLP)-mercury. The results verified that the material did not exhibit the characteristic of toxicity above the regulatory level of 0.2 mg/L for mercury (EPA, 2002a). As a result, the SAA was deactivated and the contents were disposed of as solid waste in the NTS Area 9 U10c Landfill.
- The 208-L (55-gal) drum containing a 18.9-L (5-gal) bucket of pipe dope and associated soil was subsequently transported to the Area 5 Hazardous Waste Storage Pad for off-site disposal.

Based on the results of sampling, process knowledge, and applying the Data Quality Objectives (DQOs) (Appendix A), the approved closure activities at eight CASs (19-09-05, 20-23-02, 20-23-03, 20-23-04, 20-23-05, 20-23-06, 20-37-01 and 20-37-05) were to implement administrative controls (i.e., use restrictions). This closure method was supported by the following:

- Results of samples collected from the bottom of six open cellars, one backfilled cellar, and a mud pit during site characterization indicated the presence of TPH above the action

level (NNSA/NSO, 2003). It was difficult to collect representative samples from the floor of the backfilled cellar, which was the most likely location for COC. For this reason, and based on process knowledge of drill back methods using diesel fuel as a lubricant, it is reasonable to assume that TPH contamination above the action level is present at the bottom of the backfilled postshot cellar.

- A calculation of the residual saturation of diesel in drilling mud (i.e., the amount of diesel that one kilogram of drilling mud can hold), showed that 1 kilogram of drilling mud can hold 37,000 milligrams of diesel (37,000 mg/kg) (NNSA/NSO, 2003). The highest concentration of TPH found in the CAU 358 CASs was 5,330 mg/kg (excluding the bucket of pipe dope at CAS 18-09-01), indicating that TPH is immobile at all CAU 358 sites (NNSA/NSO, 2003).

- An "A through K" evaluation (Nevada Administration Code [NAC], 2002) of all the postshot cellars and contaminated mud pits showed there was no significant risk to human health or the environment from these sites.

- Additionally, the CAU 358 cellars and mud pit CASs are all located within Areas 19 and 20 of the NTS, which is designated as a nuclear test zone (U.S. Department of Energy, Nevada Operations Office [DOE/NV], 1996). Because of the unique nature of the historic activities performed at these sites, access will likely be controlled for any use other than nuclear testing or weapons testing (DOE/NV, 1996). Therefore, there will be no uncontrolled contact with the cellar and mud pit CASs in CAU 358 by NTS personnel or by members of the public.

1.3 CLOSURE REPORT CONTENTS

This CR is divided into the following sections:

- Section 1.0 - Introduction
- Section 2.0 - Closure Activities
- Section 3.0 - Waste Disposition
- Section 4.0 - Closure Verification Results
- Section 5.0 - Conclusions and Recommendations
- Section 6.0 - References
- Appendix A - Data Quality Objectives for CAU 358
- Appendix B - Use Restriction Documentation
- Appendix C - Sample Analytical Results

- Appendix D - Field Photographs
- Appendix E - Waste Disposition Documentation
- Appendix F - Closure Certification
- Appendix G - As-Built Documentation
- Appendix H - Modifications to the Post-Closure Plan
- Appendix I - NEPA Environmental Evaluation Checklist
- Appendix J - Nevada Environmental Restoration Project Document Review Sheet
- Distribution List

The following standard appendices are included in this CR following the FFACO CR outline but do not contain any material because they do not apply to closure of CAU 358:

- Closure Certification - Not applicable.
- As-Built Documentation - Not applicable because no engineered structures were constructed.
- Modifications of the Post-Closure Plan - Not Applicable. No post-closure monitoring is required.

1.3.1 Data Quality Objectives

The DQOs (Appendix A) used for establishing the approved closure activities for CAU 358 were generated from sample analysis data collected from each CAS and available process knowledge (NNSA/NSO, 2003).

The primary conceptual site model (CSM) for the cellars as identified by the CAU 358 DQOs (Appendix A) (NNSA/NSO, 2003) assumed that the only COC was petroleum hydrocarbons. This was confirmed through analysis of samples collected from the cellars. Petroleum hydrocarbons were present in samples collected from the base of each of the six open cellars. Based on the historical use of the cellars, petroleum hydrocarbons are assumed to be present in all of the cellars. The TPH contamination is assumed to be confined to the cellar floors and poses no significant risk to human health or the environment. No preferential pathways for the movement or infiltration of the petroleum hydrocarbons to groundwater were identified based on the geohydrology of the area where the CASs are located.

Analytical results for samples collected from the CAU 358 mud pits show that TPH is the only COC present and is confined to the drilling mud, as indicated in the DQOs CSM. Based on these results and the results of sampling conducted at CAU 417 (DOE/NV, 1998) to characterize TPH contaminated drilling mud and the material underlying a mud pit, it is reasonable to assume

that any TPH contamination at CAU 358 mud pits is confined to the drilling mud contained in the mud pits and poses no significant risk to human health or environment.

2.0 CLOSURE ACTIVITIES

This section details the specific closure activities completed for CAU 358: Areas 18, 19, 20 Cellars/Mud Pits. Copies of the analytical data for all collected soil samples are included in Appendix C. Photographs documenting the closure activities are included in Appendix D.

2.1 DESCRIPTION OF CORRECTIVE ACTION ACTIVITIES

2.1.1 Preplanning and Site Preparation

Closure activities for CAU 358 were completed using the NDEP-approved SAFER Plan (NNSA/NSO, 2003). Prior to beginning field activities, the following pre-field activities were completed:

- Preparation of National Environmental Policy Act Evaluation Checklist (Appendix I).
- Preparation of the Field Management Plan for Corrective Action Unit 358 (Bechtel Nevada [BN], 2003).
- Preparation of the Site-Specific Health and Safety Plan for Corrective Action Unit 358 (BN, 2003).
- Preparation of NNSA/NSO Real Estate/Operations Permit.
- Preparation of a BN Excavation Permit.

The following is the scope of the approved closure activities implemented for CAU 358.

2.1.2 CAS 02-99-01: Oil Stained Dirt on Concrete

Historical visits to the site in 1998 and 1999, determined the site to be a large pile of magnetite on a concrete pad, and identified a hydrocarbon spill on the soil near the concrete pad. Soil samples were collected on November 25, 1998, from the center of the hydrocarbon spill and analyzed for Volatile Organic Compounds (VOCs), SVOCs, TPH, Polychlorinated Biphenyls (PCBs), total Resource Conservation and Recovery Act (RCRA) metals, gross alpha and beta emitters, and gamma emitters (IT Corporation [IT], 2001). Sample results indicated the presence of TPH at levels greater than the Nevada State Action Level of 100 mg/kg. Total lead was reported for one soil sample at 118 mg/kg, less than the action level (EPA, 2002b). All other analytical results were below action levels (NNSA/NSO, 2003).

On June 7, 2001, additional samples were collected from two locations on the magnetite pile and analyzed for total RCRA metals and gamma emitters. The analytical results verified that the magnetite was not hazardous and could be disposed of as solid waste (NNSA/NSO, 2003). In addition, a magnet was used to verify that the magnetite pile exhibited magnetic properties.

In July 2003, the approved closure activities were accomplished by removing and disposing of all the magnetite and hydrocarbon-impacted soil following the NDEP-approved SAFER Plan (NNSA/NSO, 2003). Approximately 99.4 m^3 (130 yd^3) of magnetite was removed from the concrete pad and disposed of in the NTS Area 9 U10c Landfill. Approximately 53.5 m^3 (70 yd^3) of hydrocarbon-impacted soil was excavated from the hydrocarbon spill site and stockpiled on plastic on the adjacent concrete pad.

As the hydrocarbon-impacted soil was stockpiled, fifteen soil samples were collected and composited into five samples (029901A, B, C, D, and E). The samples were submitted to an off-site laboratory for TCLP-lead analysis. The sample results provided in Table 1 show that TCLP-lead levels were below the laboratory reporting limit of 38.5 micrograms per liter (µg/L). The sample locations are shown in Figure 2. Based on these results, the stockpiled soil was disposed of as hydrocarbon-impacted soil. In addition, three partially buried concrete blocks were removed from the center of the petroleum hydrocarbon spill and disposed of in the NTS Area 6 Hydrocarbon Landfill. These concrete blocks were likely a part of the building's foundation when the building was operational.

TABLE 1 - ANALYTICAL RESULTS FOR CAS 02-99-01 (Stockpiled Soil)

SAMPLE IDENTIFICATION	TCLP[a] - LEAD (µg/L)[b]
Sample Delivery Group V2022	
029901A	< 38.5[c]
029901B	< 38.5
029901C	< 38.5
029901D	< 38.5
029901E	< 38.5

[a] Toxicity Characteristic Leaching Procedure (TCLP), sample preparation and analysis by SW-846 method 1311/6010 (U.S. Environmental Protection Agency [EPA], 1996).
[b] microgram(s) per liter
[c] < indicates result was less than the laboratory reporting limit listed for analyte.

On July 15, 2003, twelve soil samples (029901-1V through 029901-12V) and one blind duplicate (029901-0V) were collected by hand from the bottom of the excavation, approximately 35.6 centimeters (cm) (14 inches [in]) below ground surface (bgs). The sample locations are shown in Figure 2. The samples were field screened for TPH using a Petroflag® test kit and then submitted to an off-site laboratory for TPH full scan analysis. The sample results provided in Table 2 show that TPH is no longer present in the soil at levels greater than the Nevada State Action Level of 100 mg/kg.

On August 25, 2003, the petroleum hydrocarbon spill excavation was backfilled with approximately 57.3 m^3 (75 yd^3) of clean fill that was transported from the NTS Area 9 U10c Landfill.

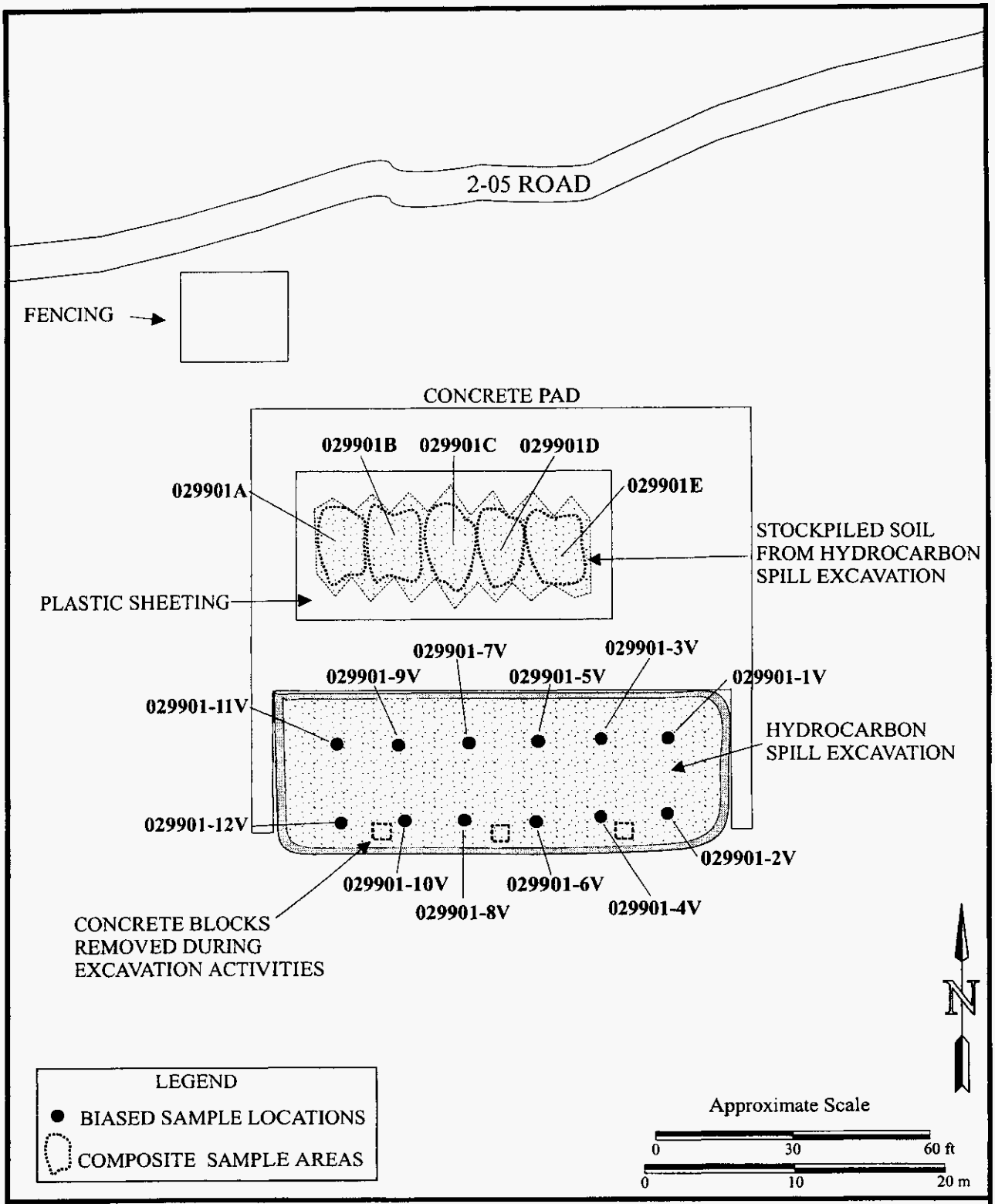

FIGURE 2
CAS 02-99-01 SAMPLE LOCATIONS

TABLE 2 - ANALYTICAL RESULTS OF SOIL FOR CAS 02-99-01 (Excavation)

SAMPLE IDENTIFICATION	DIESEL RANGE[a] (mg/kg)[b]	OIL RANGE[a] (mg/kg)	GASOLINE RANGE[a] (µg/kg)[c]	TPH[a] (mg/kg)
Sample Delivery Group V2025				
029901-0V (blind duplicate of 029901-1V)	< 12.4[d]	< 12.4	< 33	< 12.4
029901-1V	< 12.2	< 12.2	< 30	< 12.2
029901-2V	< 12.2	20	< 30	20
029901-3V	< 12.3	< 12.3	< 30	< 12.3
029901-4V	< 12.2	< 12.2	< 30	< 12.2
029901-5V	< 12.4	< 12.4	< 30	< 12.4
029901-6V	< 12.3	< 12.3	< 30	< 12.3
029901-7V	< 12.5	< 12.5	< 30	< 12.5
029901-8V	< 12.4	< 12.4	< 30	< 12.4
029901-9V	< 12.8	< 12.8	< 33	< 12.8
029901-10V	< 12.4	< 12.4	< 30	< 12.4
029901-11V	< 12.4	< 12.4	< 33	< 12.4
029901-12V	< 12.3	< 12.3	< 30	< 12.3

[a] Total Petroleum Hydrocarbons (TPH) full scan, gasoline, diesel, and oil analyses by SW-846 method 8015 modified (EPA, 1996).
[b] milligram(s) per kilogram
[c] microgram(s) per kilogram
[d] < indicates result is less than the laboratory reporting limit listed for analyte.

2.1.3 CAS 03-22-33: Bucket; Spill; Debris

CAS 03-22-33 consisted of several piles of magnetite and magnetite mixed with soil. The material was determined to be magnetite by its appearance and magnetic properties during a previous site visit. A site visit in 1993 determined that a previously reported bucket had been removed. This was verified during a site visit on June 8, 2001. General debris in the area included cable, rope, concrete, wire, and wood.

Samples of the magnetite material were collected on August 27, 1997, and analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, gross alpha/beta emitters, and gamma emitters (IT, 2001). All analytical results were below action levels (NNSA/NSO, 2003).

In June 2001, additional samples of the magnetite material from two different locations were collected and analyzed for total RCRA metals, TCLP-selenium, and gamma emitters. The analytical results showed that the magnetite was not hazardous and could be disposed of as solid waste (NNSA/NSO, 2003).

In July and August 2003, the approved closure activities were completed by removing and disposing of all the magnetite and debris following the SAFER Plan (NNSA/NSO, 2003). Approximately 378.5 m^3 (495 yd^3) of magnetite and magnetite mixed with soil were removed and disposed of as solid waste in the NTS Area 9 U10c Landfill. During the removal activities, debris was uncovered beneath a pile of magnetite. The debris included rope, tarpaulin, wood, scrap metal, and concrete. Approximately 23 m^3 (30 yd^3) of debris and surrounding soil were excavated and stockpiled on plastic, and a biased sample was collected from the pile for further waste characterization. The sample (032233-1) was analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma emitters. The sample results provided in Table 3 show that the debris was not hazardous and could be disposed of as solid waste. The sample location is shown in Figure 3.

On August 25, 2003, the debris pile was removed from the site and disposed of as solid waste in the NTS Area 9 U10c Landfill. The debris excavation was backfilled with soil located on the site along with an additional 30.6 m^3 (40 yd^3) of clean fill that was transported to the site from the NTS Area 9 U10c Landfill. The site was graded to match the surrounding topography.

2.1.4 CAS 03-99-04: Spill

The site was visited in 1999 and the spill was determined to be epoxy tar. This was confirmed by site visit in 2001. The epoxy tar spill consisted of several smaller spills scattered over a large area with a portion of the epoxy tar mixed with soil piles.

On June 11, 2001, samples were collected of the epoxy tar and associated soil. The samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma emitters. Sample results indicated the presence of TPH (diesel and oil ranges) greater than the Nevada State Action Level of 100 mg/kg and several SVOCs above the U.S. EPA Region IX Preliminary Remediation Goals (PRGs) (EPA, 2002b) for industrial soils. All other analytical results were below action levels (NNSA/NSO, 2003).

In July 2003, the approved closure activities were completed by excavating and disposing of all the epoxy tar and associated soil following the NDEP-approved SAFER Plan (NNSA/NSO, 2003). Approximately 218 m^3 (285 yd^3) of epoxy tar and associated soil were excavated from the site and disposed of in the NTS Area 6 Hydrocarbon Landfill. Fifteen surface soil samples (039904-V1 through 039904-V15) and one blind duplicate (039904-V0) were collected by hand from the spill areas. The samples were field screened for TPH using a Petroflag ® test kit and then submitted to an off-site laboratory for TPH and SVOC analyses. The sample results provided in Table 4 show that TPH was below detection limits and the previously identified SVOCs were all below the PRGs for industrial soils (EPA, 2002b). The sample locations are shown in Figure 4. The site was graded to match the surrounding topography.

TABLE 3 - ANALYTICAL RESULTS FOR CAS 03-22-33

SAMPLE IDENTIFICATION	DIESEL RANGE[a] (mg/kg)[b]	OIL RANGE[a] (mg/kg)	GASOLINE RANGE[a] (µg/kg)[c]	TPH[a] (mg/kg)	RCRA[d] METALS (mg/kg)	VOCs[e] (µg/kg)	SVOCs[f] (µg/kg)	PCBs[g] (µg/kg)	GAMMA EMITTERS[h] (pCi/g)[i]
Sample Delivery Groups V2027 and V2028									
032233-1	< 12.6	53	< 30	53	< Action Levels[j]	Methylene Chloride....12^ Acetone.....3* Xylene.....2* All others.....ND[k]	Pentachlorophenol.....350* Di-n-butylphthalate.....25* bis (2-Ethylhexyl) phthalate.....36* All others.....ND	< 330	< Free Release Criteria[l]

[a] Total Petroleum Hydrocarbons full scan, gasoline, diesel, and oil analysis by SW-846 method 8015 modified (EPA, 1996).
[b] milligram(s) per kilogram
[c] microgram(s) per kilogram
[d] Resource Conservation and Recovery Act metal analysis by SW-846 methods 6010B and 7471A (EPA, 1996).
[e] Volatile Organic Compound analysis by SW-846 method 8260 (EPA, 1996).
[f] Semi-Volatile Organic Compound analysis by SW-846 method 8270 (EPA, 1996).
[g] Polychlorinated Biphenyl analysis by SW-846 method 8082 (EPA, 1996).
[h] Gamma spectroscopy analysis by method HASL 300, 4.5.2.3 (U.S. Department of Energy [DOE], 1997)
[i] picoCurie(s) per gram
[j] Preliminary Remediation Goals used as action levels were established by U.S. EPA Region IX (EPA, 2002b).
[k] Not Detected at the laboratory reporting limit.
[l] As specified in Table 4.2 of the Nevada/Yucca Mountain Project Radiological Control Manual (DOE/NV, 2000a).

< indicates result is less than the laboratory reporting limit listed for analyte.
^ Analyte is found in the associated laboratory blank and in the sample, but the concentration in the sample is not more than 4 times the associated laboratory blank concentration. See Appendix C.
* Value is estimated because its less than the laboratory Contract Required Quantitation Limit.

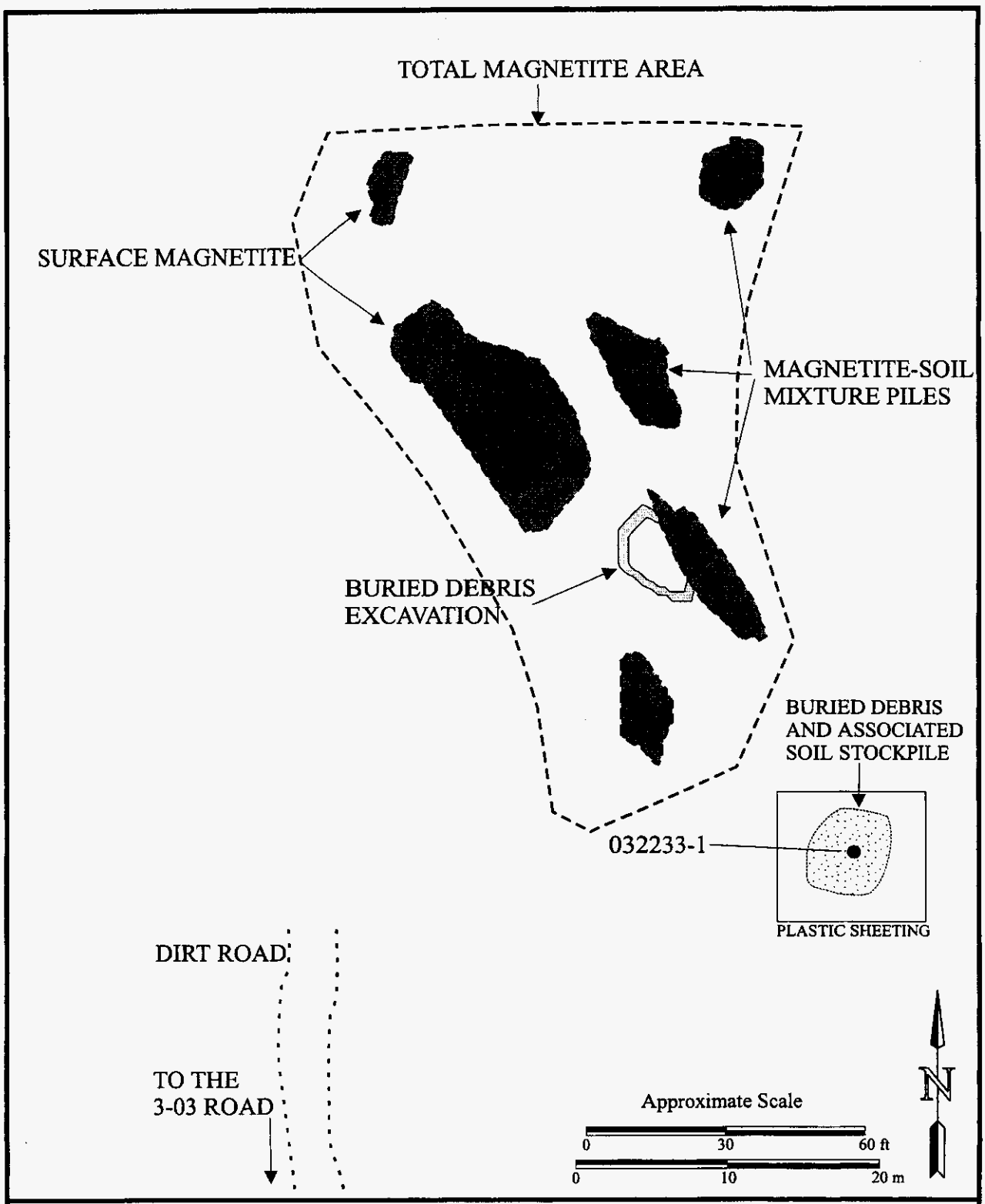

FIGURE 3
CAS 03-22-33 SAMPLE LOCATIONS

TABLE 4 - ANALYTICAL RESULTS FOR CAS 03-99-04

SAMPLE IDENTIFICATION	DIESEL RANGE[a] (mg/kg)[b]	OIL RANGE[a] (mg/kg)	GASOLINE RANGE[a] (µg/kg)[c]	TPH[a] (mg/kg)	SVOCs[a] (µg/kg)
Sample Delivery Group V2026					
039904-V1	< 12.8[e]	< 12.8	< 33	< 12.8	Di-n-butylphthalate....30** bis (2-Ethylhexyl) phthalate.....45** All others.....ND[f]
039904-V2	< 12.4	< 12.4	< 30	< 12.4	bis (2-Ethylhexyl) phthalate.....35** All others.....ND
039904-V3	< 12.4	< 12.4	< 30	< 12.4	bis (2-Ethylhexyl) phthalate.....130** All others.....ND
039904-V4	< 13.1	< 13.1	< 33	< 13.1	bis (2-Ethylhexyl) phthalate.....22** All others.....ND
039904-V5	< 12.9	< 12.9	< 33	< 12.9	Di-n-butylphthalate....37** bis (2-Ethylhexyl) phthalate.....65** All others.....ND
039904-V6	< 12.4	< 12.4	< 30	< 12.4	bis (2-Ethylhexyl) phthalate.....24** All others.....ND
039904-V7	< 12.3	< 12.3	< 30	< 12.3	Phenanthrene.....33* Di-n-butylphthalate.....100** Fluoranthene.....58* Pyrene.....44* Benzo(a)anthracene.....19* Chrysene.....29* bis (2-Ethylhexyl) phthalate.....21** Benzo(b)fluoranthene.....35* Benzo(k)fluoranthene.....26* Benzo(a)pyrene.....22* Indeno (1,2,3-cd) pyrene.....21* Benzo (g,h,i)perylene.....25* All others.....ND
039904-V0 (duplicate of 039904-V7)	< 12.3[e]	< 12.3	< 33	< 12.3	Di-n-butylphthalate....29** Benzo(b)flouranthene..... .....17* All others.....ND[f]

TABLE 4 - ANALYTICAL RESULTS FOR CAS 03-99-04 (continued)

SAMPLE IDENTIFICATION	DIESEL RANGE[a] (mg/kg)[b]	OIL RANGE[a] (mg/kg)	GASOLINE RANGE[a] (µg/kg)[c]	TPH[a] (mg/kg)	SVOCs[d] (µg/kg)
039904-V8	< 12.6	< 12.6	< 33	< 12.6	Di-n-butylphthalate....18** bis (2-Ethylhexyl) phthalate.....34** All others.....ND
039904-V9	< 12.4	< 12.4	< 30	< 12.4	bis (2-Ethylhexyl) phthalate.....35** All others.....ND
039904-V10	< 12.5	< 12.5	< 33	< 12.5	ND
039904-V11	< 12.7	< 12.7	< 33	< 12.7	ND
039904-V12	< 12.8	< 12.8	< 33	< 12.8	ND
039904-V13	< 12.8	< 12.8	< 30	< 12.8	bis (2-Ethylhexyl) phthalate.....67** All others.....ND
039904-V14	< 12.7	< 12.7	< 30	< 12.7	bis (2-Ethylhexyl) phthalate.....21** All others.....ND
039904-V15	< 12.7	< 12.7	< 30	< 12.7	ND

[a] Total Petroleum Hydrocarbons (TPH) full scan, gasoline, diesel, and oil analyses by SW-846 method 8015 modified (EPA, 1996).
[b] milligram(s) per kilogram
[c] microgram(s) per kilogram
[d] Semi-Volatile Organic Compound (SVOCs) analysis by SW-846 method 8270 (EPA, 1996).
[e] < indicates result is less than the laboratory reporting limit listed for analyte.
[f] Not detected above laboratory reporting limits.

* Analyte found in both the sample and the associated laboratory blank. See Appendix C
** Value is estimated because its less than the laboratory Contract Required Quantitation and the analyte is found in both the sample and the associated laboratory blank. See Appendix C.

2.1.5 CAS 18-09-01: Mud Pit

The site was visited in 1999, when a mud pit containing housekeeping debris, including a 18.9-L (5-gal) bucket containing pipe dope and a small area of broken batteries, was identified. After a site visit in 2001, it was determined that the bucket was turned on its side with small amounts of the contents spilled onto the soil.

On February 7, 2002, soil samples were collected at two locations within the mud pit. At each location, samples were collected from the surface and at a depth of 0.3 meters (1 foot) bgs. Additional samples were collected from the bucket containing the unknown material and from the area covered by broken pieces of batteries. The mud pit and bucket samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma emitters. The samples from the area of broken batteries were analyzed for total RCRA metals only. Sample results for

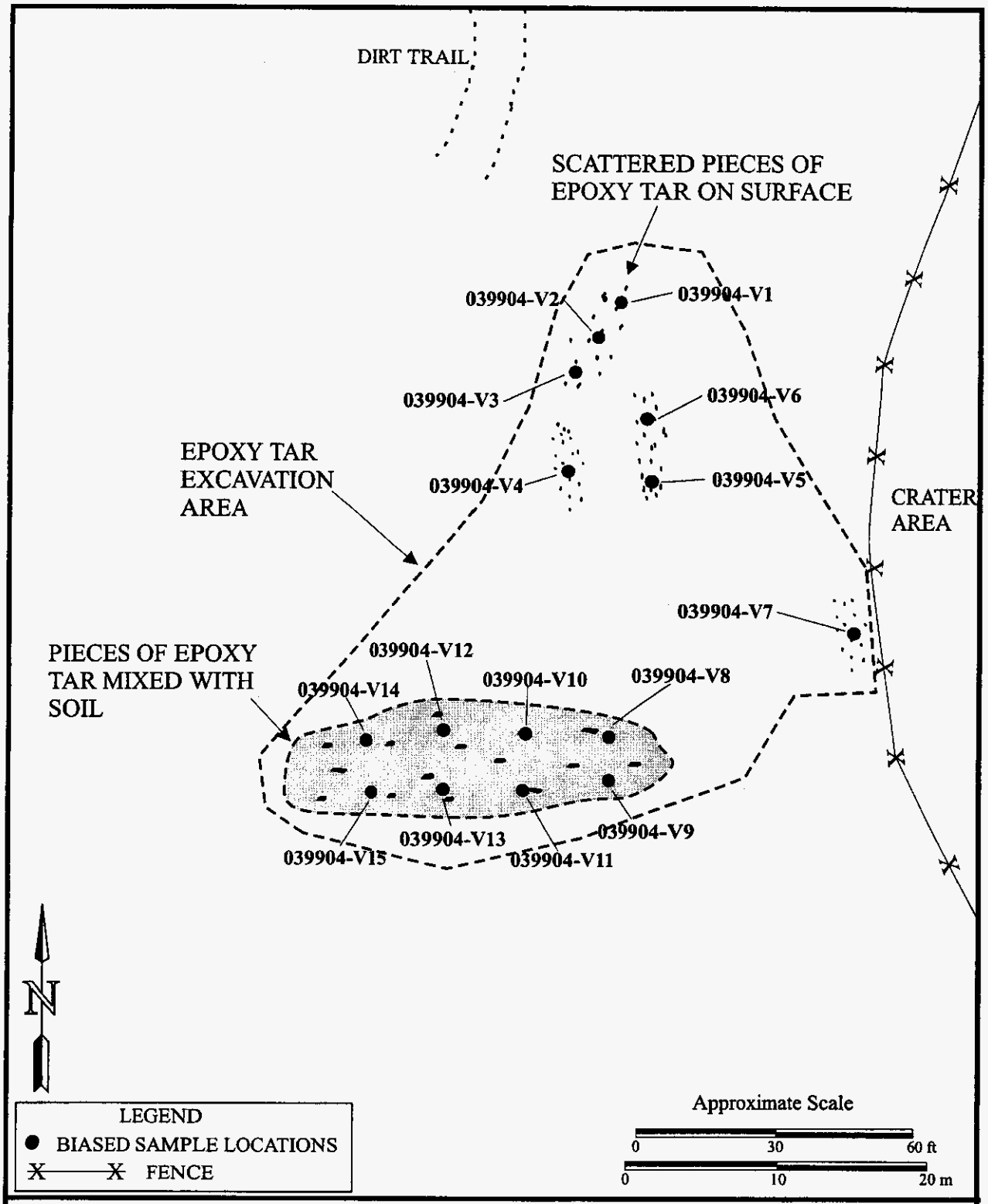

FIGURE 4
CAS 03-99-04 SAMPLE LOCATIONS

the drilling mud show no COC above action limits; however, the bucket contents showed TPH greater than the Nevada State Action Level of 100 mg/kg and total lead levels of 276 mg/kg, which indicates that the waste generated on clean up may exhibit the characteristic of toxicity for lead above the hazardous waste regulatory level of 5 mg/L (NNSA/NSO, 2003; EPA, 2002a). Results for the biased sample collected from the area of broken batteries showed total mercury of 7.0 mg/kg, which indicates that the waste generated on clean up may exhibit the characteristic of toxicity for mercury above the hazardous waste regulatory level of 0.2 mg/L (NNSA/NSO, 2003; EPA, 2002a).

In July 2003, as a best management practice, the housekeeping debris and associated soil were removed following the NDEP-approved SAFER Plan (NNSA/NSO, 2003). Approximately 0.14 m^3 (4.7 cubic feet [ft^3]) of housekeeping debris was removed from the mud pit and placed into two separate drums stored in different SAAs. The 18.9-L (5-gal) bucket, contents, and the associated soil directly below the bucket were removed by hand using a shovel and placed into a 208-L (55-gal) drum and stored in SAA number NTS0125. Two soil samples (180901-1V and 180901-2V) were collected by hand from the area directly underneath the bucket. The samples were field screened for TPH using a PetroFlag® test kit and then submitted to an off-site laboratory for TPH and TCLP-lead analyses. The sample results provided in Table 5 show that the concentrations remaining in the soil do not exceed the Nevada State Action Level of 100 mg/kg for TPH and the TCLP-lead levels were below the laboratory reporting limit. The sample locations are shown in Figure 5.

The broken batteries and associated soil were removed by hand using a shovel, and placed into a 208-L (55-gal) drum stored in SAA number NTS0131. Three soil samples (180901-3V, 180901-4V, and 180901-5V) and a blind duplicate sample (180901-0V) were collected from soil in the area of the broken batteries. The samples were submitted to an off-site laboratory for TCLP-mercury analysis. The sample results provided in Table 5 show that TCLP-mercury levels from the bottom of the hand excavation were below the laboratory reporting limit. The sample locations are shown in Figure 5.

On August 12, 2003, an additional composite soil sample (180901-6V) was collected from the SAA drum containing the broken batteries and associated soil to determine if the waste exhibited the characteristic of toxicity for mercury. The composite soil sample was submitted to an off-site laboratory and analyzed for TCLP-mercury. The sample results provided in Table 5 show that the waste was not a hazardous waste.

On September 9, 2003, the SAA containing the broken batteries and associated soil were deactivated and the waste was disposed of as solid waste in the NTS Area 9 U10c Landfill.

On September 30, 2003, the 208-L (55-gal) drum in the SAA containing the bucket of pipe dope, bucket contents, and associated soil was transported to the Area 5 Hazardous Waste Storage Pad for off-site disposal as hazardous waste. Appendix E of this report contains a copy of the On-site Waste Transport Manifest.

TABLE 5 - ANALYTICAL RESULTS FOR CAS 18-09-01

SAMPLE IDENTIFICATION	DIESEL RANGE[a] (mg/kg)[b]	OIL RANGE[a] (mg/kg)	GASOLINE RANGE[a] (µg/kg)[c]	TPH[a] (mg/kg)	TCLP[d] LEAD (µg/L)[e]	TCLP[d] MERCURY (µg/L)
Sample Delivery GroupV2014						
Underneath Bucket						
180901-1V	< 12.1[f]	21	< 30	21	< 38.5	NS[g]
180901-2V	< 12.1	17	< 30	17	< 38.5	NS
Broken Batteries						
180901-3V	NS	NS	NS	NS	NS	< 0.10
180901-4V	NS	NS	NS	NS	NS	< 0.10
180901-5V	NS	NS	NS	NS	NS	< 0.10
180901-0V (blind duplicate of 180901-5V)	NS	NS	NS	NS	NS	< 0.10
Sample Delivery Group V2050						
208 L (55-gal) Drum						
180901-6V	NS	NS	NS	NS	NS	0.18

[a] Total Petroleum Hydrocarbons full scan, gasoline, diesel, and oil analyses by SW-846 method 8015 modified (EPA, 1996).
[b] milligram(s) per kilogram
[c] microgram(s) per kilogram
[d] Toxicity Characteristic Leaching Procedure, lead and mercury preparation and analysis by SW-846 methods 1311/6010 and 1311/7470 (EPA, 1996).
[e] microgram(s) per liter
[f] < indicates result is less than laboratory reporting limit for analyte.
[g] Not Sampled

2.1.6 Sites Closed with Use Restrictions

At eight CASs the approved closure activities were accomplished by implementing administrative controls (i.e., use restrictions). Prior to implementing administrative controls, six open cellars were backfilled with clean fill by the BN Borehole Management program. Backfilling was performed on May 30 and June 10, 2003. Survey coordinates were obtained for each of the eight CASs, and a CAU Use Restriction Information form was completed for each site (Appendix B). The following CASs were closed in place with administrative controls (the cellar is the only part of CAS 20-37-01 that has a land use restriction implemented):

- CAS 19-09-05, Mud Pit
- CAS 20-23-02, Postshot Cellar (backfilled on 5/30/2003)
- CAS 20-23-03, Cellar (backfilled on 5/30/2003)
- CAS 20-23-04, Postshot Cellar

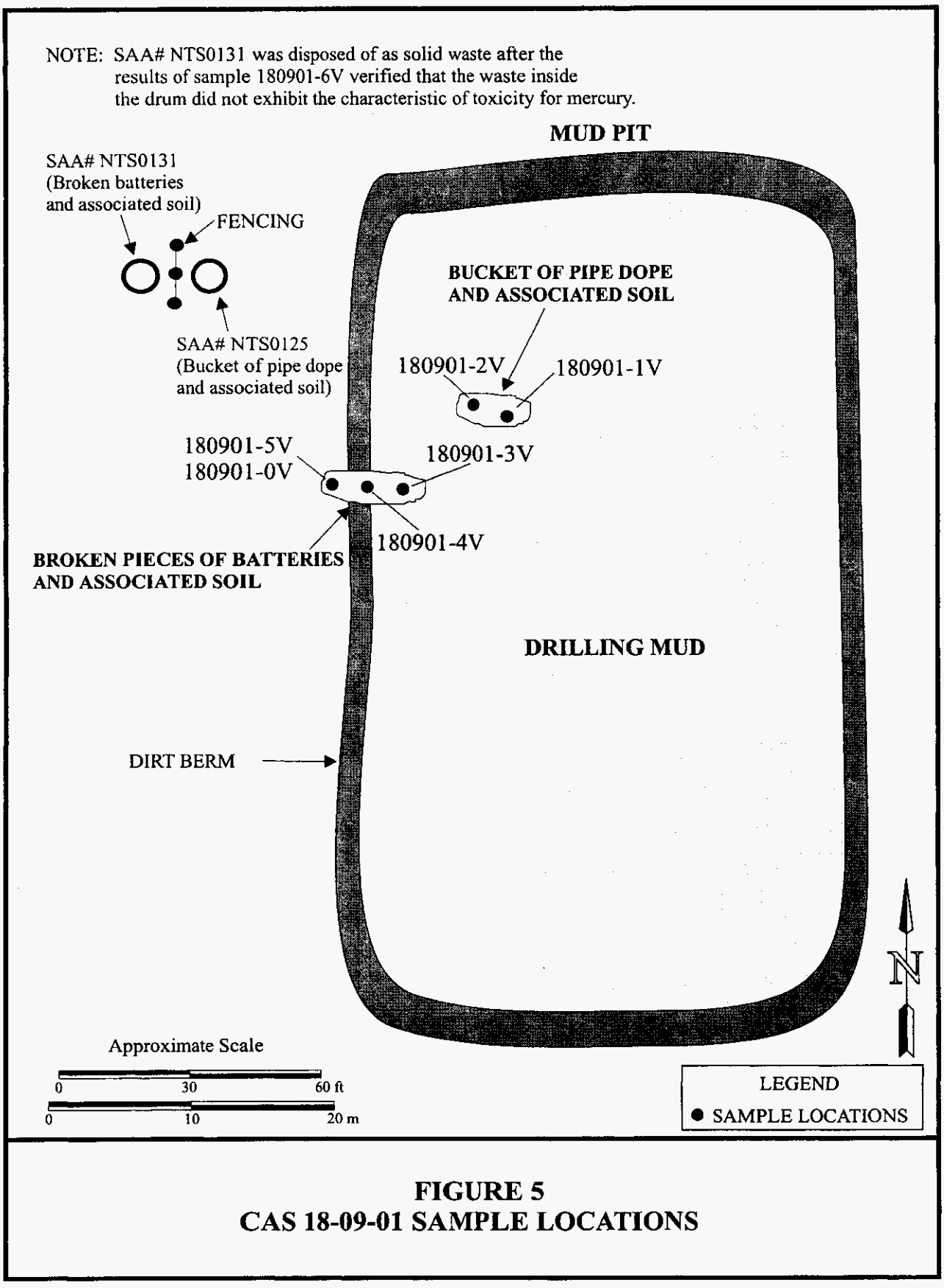

FIGURE 5
CAS 18-09-01 SAMPLE LOCATIONS

- CAS 20-23-05, Postshot Cellar (backfilled on 5/30/2003)
- CAS 20-23-06, Cellar (backfilled on 5/30/2003)
- CAS 20-37-01, Cellar & Mud Pit (use restriction for cellar only; cellar backfilled on 6/10/2003)
- CAS 20-37-05, Cellar (backfilled on 5/30/2003)

2.2 DEVIATIONS FROM SAFER PLAN AS APPROVED

The NDEP-approved SAFER Plan (NNSA/NSO, 2003) was modified before and during field activities to adjust to changed site conditions. The following deviations occurred from the approved scope of work as presented in the NDEP-approved SAFER Plan.

CAS 02-99-01, Oil Stained Dirt on Concrete:

The SAFER Plan (NNSA/NSO, 2003) states that the total volume of hydrocarbon-impacted soil to be excavated is 3 m^3 (4 yd^3); however, after a site walk down prior to the start of field work, the hydrocarbon spill was identified as being larger than anticipated and resulted in more hydrocarbon-impacted soil (53.5 m^3 [70 yd^3]) being excavated. Because of this larger excavation area, additional verification samples were collected. In addition, five composite soil samples were collected from the hydrocarbon-impacted soil to verify that the soil did not exhibit the characteristic of toxicity for lead above the regulatory level.

CAS 03-22-33, Bucket; Spill; Debris:

The SAFER Plan (NNSA/NSO, 2003) states that the total volume of magnetite and magnetite-soil mixture to be removed is 90.2 m^3 (118 yd^3); however, after a site walk down prior to the start of field work, the magnetite spill was identified as being larger and resulted in more magnetite and soil (378.5 m^3 [495 yd^3]) being removed. In addition, during the magnetite excavation activities, some buried debris was exposed, removed for further characterization, and disposed of based on waste characterization results. The debris and associated soil were stockpiled on plastic while awaiting characterization sample results.

CAS 03-99-04, Spill:

The SAFER Plan (NNSA/NSO, 2003) states that the total volume of epoxy tar and associated soil to be excavated is 45 m^3 (60 yd^3); however, after a site walk down prior to the start of field work, the volume of epoxy tar was identified as being larger than anticipated, resulting in additional material (218) m^3 (285 yd^3) being excavated. Because of the larger volume of excavated material, additional verification samples were collected.

CAS 18-09-01, Mud Pit:

The SAFER Plan (NNSA/NSO, 2003) states that one soil verification sample would be collected from the area of the bucket and two samples from the area of the broken batteries. Prior to going in the field, a decision was made to collect one additional sample at each location to better verify that the approved closure activities were completed at each of these sites.

2.3 CORRECTIVE ACTION SCHEDULE AS COMPLETED

Waste characterization sampling was performed as part of the CAU 358 SAFER Plan development (NNSA/NSO, 2003). Corrective actions began in July 2003 and were completed in September 2003. Details of the closure field activities are provided below.

General	
• Site waste characterization sampling	February 7 - June 11, 2003
CAS 18-09-01 closure activities:	
• Mobilize equipment/personnel and perform site set-up	July 7, 2003
• Remove housekeeping debris (18.9 L [5-gal] bucket, contents, broken batteries, and all associated soil) and collect clean-up verification samples	July 7 - 8, 2003
• Collect additional sample from SAA (batteries) drum	August 12, 2003
• Remove and dispose of drum containing broken batteries and associated soil	September 9, 2003
• Remove SAA (pipe dope) drum for disposal	September 30, 2003
CAS 02-99-01 closure activities:	
• Mobilize equipment/personnel and perform site set-up	July 8 - 9, 2003
• Remove and dispose of magnetite from concrete pad	July 10 and 14, 2003
• Excavate hydrocarbon spill, stockpile soil on concrete pad, and collect composite samples from stockpiled soil	July 14 - 15, 2003
• Collect clean-up verification samples from hydrocarbon spill	July 15, 2003
• Remove stockpiled hydrocarbon-impacted soil from the concrete pad for disposal	August 4, 2003
• Backfill hydrocarbon spill excavation and demobilize	August 25, 2003
CAS 03-99-04 closure activities:	
• Mobilize equipment/personnel and perform site set-up	July 16, 2003
• Excavate epoxy tar spill for disposal	July 16 - 17, 2003
• Collect clean-up verification samples	July 17, 2003
• Grade site and demobilize	July 17, 2003

CAS 03-22-33 closure activities:

• Mobilize equipment/personnel and perform site set-up	July 21, 2003
• Excavate magnetite and magnetite-soil piles for disposal	July 21 - 24, 2003
• Excavate buried debris and stockpile on site	July 21 - 22, 2003
• Collect characterization samples of stockpiled debris	July 22, 2003
• Remove stockpiled debris for disposal	August 25, 2003
• Backfill excavation and grade site	August 25, 2003

Closure activities for remaining CASs

• Survey CASs for use restrictions	June 26, 2003

2.4 SITE PLAN/SURVEY PLAT

Because engineered construction was not required for site closure for any of the CASs, as-built drawings are not included in this CR. Eight CASs in CAU 358 were closed administratively by implementing use restrictions requiring site surveys. Use Restriction Information forms and accompanying figures for these CASs are provided in Appendix B.

3.0 WASTE DISPOSITION

The following types of waste were produced during CAU 358 closure activities: hydrocarbon, hazardous, and solid (sanitary). All waste was managed in accordance with state and federal regulations, U.S. Department of Energy orders, and BN procedures.

CAS 02-99-01

At CAS 02-99-01, approximately 99.4 m^3 (130 yd^3) of magnetite was removed from the concrete pad and transported to the NTS Area 9 U10c Landfill for disposal as solid waste. Approximately 53.5 m^3 (70 yd^3) of hydrocarbon-impacted soil was excavated and transported to the NTS Area 6 Hydrocarbon Landfill for disposal. Five composite soil samples of the stockpiled hydrocarbon-impacted soil were collected to verify that lead levels were less than levels for hazardous waste (EPA, 2002a). Sample results showed that the stockpiled hydrocarbon-impacted soil was not hazardous (Table 1). Figure 2 shows the locations of the verification samples. In addition, three concrete blocks were removed from the center of the hydrocarbon spill during the excavation and disposed of in the NTS Area 6 Hydrocarbon Landfill. Waste disposition records are provided in Appendix E.

CAS 03-22-33

At CAS 03-22-33, approximately 378.5 m^3 (495 yd^3) of magnetite and magnetite mixed with soil were removed and transported to the NTS Area 9 U10c Landfill for disposal as solid waste. In addition, approximately 23 m^3 (30 yd^3) of debris was excavated and transported to the NTS Area 9 U10c Landfill for disposal as solid waste. One sample was collected to characterize the debris and associated soil. The sample was analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma emitters. The sample results show that the debris was not a hazardous waste and could be disposed of as solid waste (Table 3). Figure 3 shows the locations of the samples. Waste disposition records are provided in Appendix E.

CAS 03-99-04

At CAS 03-99-04, approximately 218 m^3 (285 yd^3) of epoxy tar and associated soil were excavated and transported to the NTS Area 6 Hydrocarbon Landfill for disposal. Waste disposition records are provided in Appendix E.

CAS 18-09-01

At CAS 18-09-01, approximately 0.06 m^3 (2 ft^3) of broken batteries and associated soil were hand excavated. A composite sample was collected from the 208-L (55-gal) drum containing the broken batteries and associated soil to characterize this waste and to verify that this waste did not exhibit the characteristic of toxicity above the regulatory level for mercury. The waste was transported to the NTS Area 9 U10c Landfill for disposal as solid waste. In addition, approximately 0.08 m^3 (2.7 ft^3) of material 18.9-L ([5-gal] bucket, pipe dope, and associated soil) were hand excavated and placed into a 208-L (55-gal) drum for storage in an SAA. The material associated with the pipe dope contained TPH greater than the Nevada State Action Level of 100 mg/kg and TCLP lead levels above the regulatory level of 5 mg/L, making the material hazardous for lead (EPA, 2002a). The 208-L (55-gal) drum containing the hazardous waste was transported to the Area 5 Hazardous Waste Storage Pad pending disposal at an off-site hazardous waste disposal facility. The Onsite Waste Transport Manifest for transport of the 208-L (55-gal) drum containing the hazardous waste is provided in Appendix E.

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4.0 CLOSURE VERIFICATION RESULTS

All samples were collected by hand using decontaminated disposable polyethylene scoops and placed in appropriately labeled sample containers secured with custody seals. All samples were labeled with a unique sample number, placed on ice in coolers, and transported under a chain-of-custody to BN Analytical Services for shipment to an off-site laboratory.

The approved closure activities for four CASs were verified by the following actions:

- CAS 02-99-01: The CAU 358-approved SAFER Plan specified that five or fewer soil verification samples would be collected from the bottom of the hydrocarbon spill excavation (NNSA/NSO, 2003). Because the spill area was larger than anticipated, twelve soil samples were collected (including one blind duplicate sample) to verify that the soil with TPH levels greater than 100 mg/kg has been removed. Sample results show that the soil remaining on-site is below the action level for TPH (Table 2).

- CAS 03-22-33: The CAU 358-approved SAFER Plan specified that no verification samples would be collected from this site (NNSA/NSO, 2003).

- CAS 03-99-04: The CAU 358-approved SAFER Plan specified that ten or fewer soil verification samples would be collected from the excavation (NNSA/NSO, 2003). The samples collected from the excavation were analyzed for TPH full scan and SVOCs. Because the volume of epoxy tar was larger than anticipated, fifteen soil samples were collected (including one blind duplicate sample) to verify that the soil with TPH levels greater than 100 mg/kg has been removed (Table 4). Sample results show that the soil remaining on-site is below the action level for TPH and below the PRGs for all SVOCs. Figure 4 shows the locations of the samples.

- CAS 18-09-01: The CAU 358-approved SAFER Plan specified that one soil verification sample from the area of the bucket and two samples from the area of broken batteries would be collected (NNSA/NSO, 2003). Two verification samples were collected from the bucket area and three (including one blind duplicate) verification samples were collected from the area of broken batteries. Verification sample results from the area of the bucket show that the soil remaining on-site is below the action levels for TPH and lead (Table 5). Verification sample results from the area of broken batteries show that the soil remaining on-site is below the action level for mercury (Table 5). Figure 5 shows the locations of the samples.

4.1 DATA QUALITY ASSESSMENT

During collection of all samples, standard quality assurance/quality control (QA/QC) samples were also collected (i.e., one blind duplicate was submitted to the analytical laboratory for every 20 samples collected). Also, the analytical laboratory followed standard QA/QC procedures during sample analysis, including matrix spike/matrix spike duplicate and spiked surrogate percent recovery analysis.

The approved closure activities met the criteria specified in the DQOs provided in the NDEP-approved CAU 358 SAFER Plan (NNSA/NSO, 2003), which are also provided in Appendix A of this CR. The DQO's primary CSMs are considered the probable scenarios for the conditions at the CASs.

CAS 02-99-01

The primary CSM assumed that only petroleum hydrocarbons were released to the soil. The alternative CSM provided for a more extensive petroleum hydrocarbon release than assumed in the primary CSM. After additional characterization sampling was completed, lead was identified as being a potential COC along with the petroleum hydrocarbons. During site remediation activities, composite soil samples were collected from the excavated hydrocarbon-impacted soil verifying that the lead levels were below hazardous waste levels. As a result, the primary CSM for this CAS was an accurate representation of the site and the data collected for the site met the DQOs.

CAS 03-22-33

A primary CSM had been developed for this site even though sample analyses indicated that COC were not present above regulatory levels. The primary CSM assumed that magnetite was located on the surface. During site remediation activities, debris was found buried underneath a pile of the magnetite. Sample results showed that the debris was not hazardous and could be disposed of as solid waste. An alternate CSM was not necessary for this site because sample analyses indicated that COC are not present above regulatory levels.

CAS 03-99-04

The primary CSM assumed that petroleum hydrocarbons and associated COC (several SVOCs) were released to the soil and that the COC did not extend beyond the limits of the immediate soil beneath the epoxy tar release. Sample analyses support this model and indicate that petroleum hydrocarbons and SVOCs were limited to the pieces of epoxy tar and associated soil to a depth of approximately 15.2 cm (6 in) bgs. The CSM for CAS 03-99-04 was an accurate representation of the site and the data collected met all DQOs.

CAS 18-09-01

The primary CSM assumed that a minimal amount of TPH was released from the bucket. Also associated with this CAS is a small surface area containing broken batteries that have released small amounts of mercury to the surface soil. The amount of soil underneath the bucket impacted with TPH was minimal because the hydrocarbons were contained by the pipe dope within the bucket. As a result, a small amount of soil was removed from underneath the bucket. The bucket, bucket contents, and the small amount of soil underneath the bucket were disposed of as hazardous waste because of elevated lead levels in the pipe dope. In addition, analytical results for characterization samples collected from the soil around the area containing broken batteries showed that mercury was present in the soil. A sample was collected from the generated waste and analyzed for TCLP-mercury. The analytical result showed that the waste was not hazardous for mercury, and the broken batteries and associated soil were disposed of as solid waste. The CSM for CAS 18-09-01 was an accurate representation of the site and the data collected met all DQOs.

CASs associated with cellars and a mud pit

The primary CSM for the cellars as identified by the CAU 358 DQOs (NNSA/NSO, 2003) assumed that TPH was the only COC present. This was confirmed through analyses of samples collected from the cellars. TPH was present in samples collected from the base of the six open cellars. Based on the historical use of the cellars, TPH is assumed to be present in the backfilled cellar, CAS 20-23-04. The TPH contamination is assumed to be confined to the cellar floors and poses no significant risk to human health or the environment. No preferential pathways for the movement or infiltration of the TPH to groundwater were identified based on the geohydrology of the CASs.

For the mud pit (CAS 19-09-05), the primary CSM assumed that TPH, if present, is the only COC, and that it is limited to the drilling mud at the base of the mud pit. Analytical results for samples collected from other mud pits show that if TPH is present, it is the only COC present and is confined to the drilling mud. Based on these results and the results of sampling conducted at CAU 417 (DOE/NV, 1998) to characterize TPH contaminated drilling mud and the material underlying a mud pit, it is reasonable to assume that any TPH contamination at CAU 358 mud pits is confined to the drilling mud contained in the mud pits and poses no significant risk to human health or environment. No preferential pathways for the movement or infiltration of TPH to groundwater were identified based on the geohydrology of the CAS.

4.2 USE RESTRICTIONS

Use restrictions were implemented for eight of the 17 CASs that comprise CAU 358. The use restriction information for each CAS is included in Appendix B. The future use of any land related to CAU 358, as described by the surveyed locations listed on the Use Restriction Information forms presented in Appendix B, is restricted from any DOE activity that may alter or modify the containment control as approved by the state of Nevada and identified in the CAU 358 Closure Report unless appropriate concurrence is obtained in advance.

The use restriction boundaries are defined at each CAS by either the corner points of an existing RADCON fence, or by the corners of an existing concrete pad. (At CAS 19-09-05 existing T-posts mark the corner of the active use restriction area.) The fences were not erected as part of site closure activities, are not part of the use restrictions, and are not the responsibility of Industrial Sites project. The fences delineate existing underground radioactive material areas and are the responsibility of the BN RADCON organization. The use restriction boundary points for the indicated CAS are as follows:

- 19-09-05, mud pit existing T-posts
- 20-23-02, cellar RADCON fence corners
- 20-23-03, cellar RADCON fence corners
- 20-23-04, cellar concrete pad corners
- 20-23-05, cellar RADCON fence corners
- 20-23-06, cellar RADCON fence corners
- 20-37-01, cellar RADCON fence corners
- 20-37-05, cellar RADCON fence corners

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5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSION

At the following six CASs, the approved closure activities were accomplished by taking no further action:

- CAS 12-30-02, Drill Holes
- CAS 18-09-01, Mud Pit (debris was removed as a best management practice)
- CAS 19-09-01, Mud Pit
- CAS 19-09-07, Mud Pit
- CAS 20-09-05, Mud Pit
- CAS 20-09-08, Mud Spill

At the following three CASs, the approved closure activities were accomplished by removing all impacted material. Closure activities are detailed in Section 2 of this CR.

- CAS 02-99-01, Oil Stained Dirt on Concrete
- CAS 03-22-33, Bucket; Spill; Debris
- CAS 03-99-04, Spill

At the remaining eight CASs, the approved closure activities were accomplished by implementing administrative controls (i.e., use restrictions). For the mud pit at CAS 19-09-05, the corners of the mud pit are the boundary of the use restrictions. For the cellars, if a radiation control fence is currently in place, the corners of the fence are the boundary of the use restrictions. If no fence is in place, the corners of the concrete slab covering the cellar are the boundary of the use restrictions. See Appendix B for figures showing the layout of each use restriction boundary. The following eight CASs were closed in place with administrative controls (i.e, use restrictions):

- CAS 19-09-05, Mud Pit - [use restriction boundary is mud pit corners marked by T-posts]
- CAS 20-23-02, Postshot Cellar - [use restriction boundary is RADCON fence corners]
- CAS 20-23-03, Cellar - [use restriction boundary is RADCON fence corners]
- CAS 20-23-04, Postshot Cellar - [use restriction boundary is cement pad corners]
- CAS 20-23-05, Postshot Cellar - [use restriction boundary is RADCON fence corners]
- CAS 20-23-06, Cellar - [use restriction boundary is RADCON fence corners]
- CAS 20-37-01, Cellar & Mut Pit - [use restriction boundary is RADCON fence corners]
- CAS 20-37-05, Cellar - [use restriction boundary is RADCON fence corners]

5.2 RECOMMENDATIONS

Since the NDEP-approved closure activities as specified in the CAU 358 SAFER Plan (NNSA/NSO, 2003) have been completed as documented by this CR, NNSA/NSO requests the following:

1. A notice of completion be provided by the NDEP to the NNSA/NSO for the closure of the 17 CASs in CAU 358:

   At the following six CASs, no further action was taken as the approved closure option:
   - CAS 12-30-02, Drill Holes
   - CAS 18-09-01, Mud Pit
   - CAS 19-09-01, Mud Pit
   - CAS 19-09-07, Mud Pit
   - CAS 20-09-05, Mud Pit
   - CAS 20-09-08, Mud Spill

   At the following three CASs, clean closure was performed as the approved closure option:
   - CAS 02-99-01, Oil Stained Dirt on Concrete
   - CAS 03-22-33, Bucket; Spill; Debris
   - CAS 03-99-04, Spill

   At the following eight CASs, administrative controls were implemented as the approved closure option:
   - CAS 19-09-05, Mud Pit
   - CAS 20-23-02, Postshot Cellar
   - CAS 20-23-03, Cellar
   - CAS 20-23-04, Postshot Cellar
   - CAS 20-23-05, Postshot Cellar
   - CAS 20-23-06, Cellar
   - CAS 20-37-01, Cellar & Mut Pit
   - CAS 20-37-05, Cellar

2. CAU 358 be moved from Appendix III to Appendix IV of the FFACO, "Closed Corrective Action Units" (FFACO, 1996).

6.0 REFERENCES

BN, see Bechtel Nevada.

Bechtel Nevada. 2003a. Field Management Plan for Corrective Action Unit 358: Areas 18, 19, 20 Cellars/ Mud Pits, Nevada Test Site, Nevada, Las Vegas, NV.

Bechtel Nevada. 2003b. Site-Specific Health and Safety Plan for Corrective Action Unit 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada, Las Vegas, NV.

DOE, see U.S. Department of Energy.

EPA, see U.S. Environmental Protection Agency.

FFACO, see Federal Facility Agreement and Consent Order.

Federal Facility Agreement and Consent Order. 1996 (as amended). Agreed to by the State of Nevada, U.S. Department of Energy, and U.S. Department of Defense.

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U.S. Environmental Protection Agency. 2002b. Region IX Preliminary Remediation Goals (PRGs), San Francisco, CA.

APPENDIX A

DATA QUALITY OBJECTIVES FOR CAU 358*

*As presented and published in the approved Streamlined Approach for Environmental Restoration Plan for Corrective Action Unit 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada, February 2003, DOE/NV--837, Rev. 1, Las Vegas, NV.

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ACRONYMS AND ABBREVIATIONS

BN	Bechtel Nevada
CAS	Corrective Action Site
CAU	Corrective Action Unit
cm	centimeter(s)
COC	contaminant(s) of concern
COPC	contaminant(s) of potential concern
CR	Closure Report
CSM	conceptual site model
DNA	Defense Nuclear Agency
DOE/NV	U.S. Department of Energy, Nevada Operations Office
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
FFACO	Federal Facility Agreement and Consent Order
ft	foot/feet
in	inch(es)
IT	International Technology Corporation
LLNL	Lawrence Livermore National Laboratory
m	meter(s)
mg/kg	milligram(s) per kilogram
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NNSA/NV	U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office
NTS	Nevada Test Site
PCB	polychlorinated biphenyls
PRG	preliminary remediation goals
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
SAFER	Streamlined Approach for Environmental Restoration
SVOC	semi-volatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbon
USGS	U.S. Geological Survey
VOC	volatile organic compound
%R	percent recovery

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APPENDIX A1
DATA QUALITY OBJECTIVES FOR CORRECTIVE ACTION UNIT 358: AREAS 18, 19, 20 CELLARS/MUD PITS

The information presented here is based on historical data generated from preliminary assessment activities for Corrective Action Unit (CAU) 358 at the Nevada Test Site (NTS). Data quality objective (DQO) worksheets follow the U.S. Environmental Protection Agency (EPA) DQO guidance outline (EPA, 2000). The steps systematically build on the data acquired during preliminary assessment work and background research. Copies of the preliminary assessment work are retained in the project files.

Members of the Scoping Team and Decision Teams are as follows:

1. Scoping Team
   a. U.S. Department of Energy, National Nuclear Security Administration Nevada Operation Office (NNSA/NV)
      Janet Appenzeller-Wing
      Sabine Curtis

   b. Nevada Division of Environmental Protection (NDEP)
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2. Core Decision Team
   Janet Appenzeller-Wing
   Sabine Curtis
   Allison Urbon

3. Primary Decision Makers
   Janet Appenzeller-Wing
   Sabine Curtis

1.0 PROBLEM STATEMENT

1.1 State the problem

Twenty-seven Corrective Action Sites (CASs) that comprise CAU 358, have been identified for closure. In order to properly close these sites, current data and existing information will be evaluated and used to develop conceptual site models (CSM). This data will also be used to develop closure alternatives. As currently listed in the Federal Facility Agreement and Consent Order (FFACO) of 1996, CAU 358 is comprised of 27 CASs. Ten of the CASs are located in crater or potential crater areas, and as such, pose a safety risks to personnel working at these sites. Therefore, a FFACO modification request that these ten CASs be removed from CAU 358 and placed in CAU 544 has been prepared and submitted for approval. Upon approval of this request, CAU 358 will consist of following 17 CASs. The DQOs presented in this Appendix have been prepared for the 17 CASs remaining in CAU 358:

- CAS 02-99-01, Oil Stained Dirt on Concrete
- CAS 03-22-33, Bucket; Spill; Debris
- CAS 03-99-04, Spill
- CAS 12-30-02, Drill Holes
- CAS 18-09-01, Mud Pit
- CAS 19-09-05, Mud Pit
- CAS 19-09-06, Mud Pit
- CAS 19-09-07, Mud Pit
- CAS 20-09-05, Mud Pit
- CAS 20-09-08, Mud Spill
- CAS 20-23-02, Postshot Cellar
- CAS 20-23-03, Cellar
- CAS 20-23-04, Postshot Cellar
- CAS 20-23-05, Postshot Cellar
- CAS 20-23-06, Cellar
- CAS 20-37-01, Cellar & Mud Pit
- CAS 20-37-05, Cellar

Upon approval of the FFACO modification request the following ten CASs currently in CAU 358 will be moved to CAU 544:

- CAS 19-09-01, Mud Pits (2)
- CAS 19-09-03, Mud Pit
- CAS 19-09-04, Mud Pit
- CAS 20-09-01, Mud Pits (2)
- CAS 20-09-02, Mud Pit
- CAS 20-09-03, Mud Pit
- CAS 20-09-04, Mud Pits (2)
- CAS 20-09-06, Mud Pit
- CAS 20-09-07, Mud Pit
- CAS 20-09-10, Mud Pit

1.2 Summarize the problem - combine the relevant background information into a concise description of the problem to be resolved and known or suspected sources of disposed waste.

1.2.1 CAS 02-99-01: Oil Stained Dirt on Concrete

This site is located on the south side of Road 2-05, just before the intersection with Road 2-03 on a concrete pad. There is no oil-stained dirt on the concrete pad as implied by the Federal Facility Agreement and Consent Order (FFACO) CAS title. During site visits made on June 7, 2001, and April 18, 2001, the oil-stained dirt on the concrete pad was determined to be a pile of magnetite. This was confirmed by process knowledge and testing with a magnet. Specific historical information about this site is limited. It is unknown where the magnetite came from; however, magnetite was used as shot emplacement hole plug back material during testing activities and excess material was commonly discarded. The site was likely misidentified because the mineral magnetite is dark in color and was mistaken for total petroleum hydrocarbon (TPH) contaminated soil. The dimensions of the magnetite pile measured approximately 13 by 14 meters (m) (42 by 45 feet [ft]) with a height of 1.8 m (6 ft). Samples of the magnetite were collected by Bechtel Nevada (BN) from two different locations on June 7, 2001, and analyzed for total Resource Conservation and Recovery Act (RCRA) metals, and gamma spectroscopy. The analytical results indicated that the magnetite did not contain any of the analyzed metals above the U.S. EPA Region IX Preliminary Remediation Goals (PRGs) (EPA, 2002) for industrial soils. The results also indicated that gamma emitting radionuclides are not above NTS background levels. A radiological field screening survey of the site was also conducted and the results showed levels of radiation to be at background. These sampling results are consistent with other CASs containing discarded magnetite from CAU 387.

In addition to the magnetite a small hydrocarbon spill, located southeast of the concrete pad, was identified. The discolored soil measured 3.4 by 3 m (11 by 10 ft). The vertical extent of TPH impacted soil is not known. Sampling was conducted by International Technology Corporation (IT) on November 25, 1998, on the oil-stained dirt. The samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), total RCRA metals, gross alpha and beta, and gamma spectroscopy. The results indicated that the only COPC was TPH in the diesel/oil range (1,350 milligrams per kilogram [mg/kg]).

1.2.2 CAS 03-22-33: Bucket; Spill; Debris

This CAS is located on a dirt road approximately 305 m (1,000 ft) north from the Road 3-03. The spill is located just east of the dirt road. The spilled material was determined to be magnetite material by process knowledge and testing with a magnet during a site visit. The spill covers an area 44 by 6.7 m (145 by 22 ft) with an average thickness of approximately 30.5 centimeters (cm) (12 inches [in]). The magnetite material was also found mixed with small dirt piles on the ground surface that is part of the total area. The previously reported bucket was not found during an IT site visit on July 19, 1999, or by BN during a site visit on June 8, 2001.

Sampling was conducted by IT on August 27, 1997, on the pile of magnetite material. The sample was analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, gross alpha

and beta, and gamma spectroscopy. The analytical results indicated that the magnetite contained no COPCs above regulatory levels or PRGs for industrial soils.

Soil samples were collected by BN from two different locations of the magnetite material on June 8, 2001, and analyzed for total RCRA metals, Toxicity Characteristic Leaching Procedure (TCLP)-selenium, and gamma spectroscopy. The results indicated that the magnetite material contained no COPCs above regulatory levels or PRGs for industrial soils. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels.

Historical information about this site is limited. It is unknown where the material came from; however, magnetite was used as emplacement hole plug back material during testing activities. No additional information is required from the site to establish a closure alternative.

1.2.3 CAS 03-99-04, Spill

This CAS is located on a skid trail off of the 3-07 Road (3B Road). The site can be found by traveling approximately 0.25 mile on a skid trail. From process knowledge of past sites containing similar material, it was determined that the spill is epoxy tar. Historical information about this site is limited. It is unknown where the epoxy tar came from; however, epoxy tar was known to be used as shot emplacement hole plug back material during testing activities. The spill covers a total area of approximately 38 by 15.2 m (125 by 50 ft).

Soil samples of the epoxy tar/associated soil were collected by BN on June 11, 2001, and analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy. The results indicated that the COPCs were TPH-diesel/oil range (3,510 mg/kg) and several SVOCs above the PRGs (Table 1). All other analytical results of the epoxy tar spill were below regulatory levels and the PRGs for industrial soils. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels.

TABLE 1 - SVOCs IDENTIFIED AT CAS 03-99-04

SVOCs Identified	Analytical Method	Analytical Results (mg/kg)[a]	Minimum Reporting Limit (mg/kg)	Regulatory Limit-Preliminary Remediation Goals (mg/kg)
Benzo (a) anthracene	8270	27	6.6	2.9
Benzo (b) fluoranthene	8270	68	6.6	2.9
Benzo (k) fluoranthene	8270	57	6.6	29
Benzo (a) pyrene	8270	32	6.6	0.29
Dibenzo (a,h) anthracene	8270	14	6.6	0.29
Indeno (1,2,3-c,d) pyrene	8270	30	6.6	2.9

[a]mg/kg - milligrams per kilogram.

Sample results from the epoxy tar are consistent with results from other epoxy tar sites (CASs 02-99-02, 02-99-03, 03-99-01, 03-99-03, 03-99-06, 03-99-08, 07-99-03 closed in CAU 387). The extent of tar impacted soil is easily discerned with the naked eye; therefore, no samples are required. The SVOCs can leach from the epoxy tar into the soil. Previous verification sampling at the CASs within CAU 387 indicates that the SVOCs do not leach beyond the uppermost six inches of soil in contact with the epoxy tar. No additional information is required from the site to establish a closure alternative.

1.2.4 CAS 12-30-02, Drill Holes

This CAS is located near the P Road in Area 12 in association with the B Tunnel. The site consists of a large mound of possible drill cuttings/fill material on top of the Area 12 Mesa. The dimensions of the mound are approximately 46 by 26.5 m (151 by 87 ft) with a height of approximately 2.4 m (8 ft). It is reported that the mound was used to cover drill holes. There are two plugged drill holes that are protruding from the mound that measure approximately 7.6 cm (3 in) in diameter.

BN collected samples from two locations on April 24, 2002, from the mound at the surface. The samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy. The analytical results indicated that the mound contained no COPCs above regulatory levels or PRGs for industrial soils. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels.

Based on past site visits, historical documentation, and interviews, the mound is covering nine plugged instrumentation drill holes and one plugged exploratory drill hole with miscellaneous housekeeping debris in the area. No drilling records were identified for these particular drill holes; therefore, the drilling media used to drill the holes remain unknown. It is also unknown if the drill cuttings/fill material came from the drilling of these holes or from another location (DOE/NV, 2001a). According to the *Underground Test Area Borehole Index* documentation, all the drill holes associated with CAS 12-30-02 are plugged and/or grouted under the 2.4 m (8 ft) of fill (DOE/NV, 2001b). An interviewee indicated that the mound was reportedly created to contain leakage of radioactive gases. In other words the mound was used to cover the drill holes as a means of secondary containment after the drill holes had been grouted closed. There is no reason to suspect that the mound is impacted with COPCs and previous sampling confirms it. No additional information is required from the site to establish a closure alternative.

1.2.5 CAS 18-09-01, Mud Pit

This CAS is located in Area 18 at the end of the 18-05 Road, approximately 2.5 miles southwest from Buckboard Mesa Road. The mud pit measures 36.5 by 21.3 m (120 by 70 ft) with an approximate depth of the drill mud at 30.5 cm (12 in). The drill mud is dry and light gray in color and the sides of the mud pit are covered with vegetation. Also located in the mud pit is a bucket containing an unknown material (possibly pipe dope) and a small area consisting of broken pieces of alkaline batteries.

Two sample locations were chosen within the mud pit and samples were collected from the surface mud and at depths of 0.3 m (1 ft) below surface at each location. The soil samples were

collected by BN at CAS 18-09-01 on February 7, 2002. The samples collected from the drill mud were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy. The analytical results for the drilling mud indicate that the mud in the mud pits contain no COPCs above regulatory levels or the PRGs for industrial soils with the exception of TPH.

Two additional samples were collected from the drilling mud in the vicinity of the broken up pieces of alkaline batteries. Samples were analyzed for total RCRA metals to determine if the batteries had impacted the drilling mud. The analytical results indicated that the drilling mud in the vicinity of the broken pieces of batteries contained Mercury above the PRGs for industrial soils. The other sample was taken from the material inside the bucket of what is believed to be a lead-based pipe dope. Samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy. The analytical sample results of the material indicated a presence of TPH diesel/oil range (238,000 mg/kg). All other analytical results for samples collected were below regulatory limits and PRGs for industrial soils. It is not clear if the contents in the bucket have impacted the drilling mud in the vicinity of where the bucket is located.

Radiological surveys on the site were also conducted and the results indicated levels of radiation to be at background levels. No additional information is required from the site to establish a closure alternative. However, the drilling mud in the vicinity of the bucket should be sampled to verify that the bucket contents have not impacted the mud.

1.2.6 CAS 19-09-05, Mud Pit

This CAS is located in Area 19 on a dirt road approximately 0.8 mile off of Dead Horse Flats Road. The mud pit measures 29.5 by 24.6 m (97 by 81 ft) with the maximum depth of the drill mud at 30.5 cm (12 in). The drill mud is dry and cracked with a light gray color, and the sides of the mud pit are covered with vegetation.

Soil samples were collected by BN at CAS 19-09-05 on February 11, 2002. Samples were collected from the surface mud and from mud at depths of 15.2 cm (6 in) and 30.5 cm (12 in) at two locations. All samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy.

Analytical results indicated a presence of TPH diesel/oil range (1,108 mg/kg) for the surface sample and TPH oil range (150 mg/kg) at a 15.2-cm (6-in) depth at the first location. At the second location in the same mud pit, soil samples were also collected at the surface and at a depth of 30.5 cm (12 in). Analytical results indicated the presence of TPH oil range (170 mg/kg) in both the surface and the 30.5 cm (12 in) depth samples. All other analytical results were below regulatory limits. Radiological surveys on the site were also conducted and the results indicated levels of radiation to be at background levels. No additional information is required from the site to establish a closure alternative.

1.2.7 CASs 19-09-06, 19-09-07, 20-09-05, 20-09-08, and 20-37-01, Mud Pits and Mud Spill

These CASs are located throughout Areas 19 and 20. The surface areas of the mud pits range from approximately 50.3 by 48.8 m (165 by 160 ft) to 6 by 4.5 m (20 by 15 ft) with an assumed depth ranging from 2.54 cm (1 in) to 2.4 m (8 ft). One site, CAS 20-37-01, contains a mud pit that has been backfilled. Thickness of the mud spill at CAS 20-09-08 is 7.6 to 10 cm (3 to 4 in).

Soil samples were collected by BN at 19-09-06, 19-09-07, 20-09-05, 20-09-08, and 20-37-01 on February 7, 12 and 13, and April 17, 2002. Samples were collected from the surface mud and/or depths ranging from the surface down to 1 m (3 ft). All samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy.

The analytical results for these sites indicate that the mud in the mud pits and mud spill contains no COPCs above regulatory levels. A radiological survey of the sites was also conducted and the results indicated levels of radiation to be at background levels. No additional information is required from these site to establish a closure alternative.

1.2.8 CASs 20-23-02, 20-23-03, 20-23-04, 20-23-05, 20-23-06, 20-37-05, and 20-37-01, Cellars

These CASs are located throughout Area 20. All the cellars were open from the top with the exception of CAS 20-23-04, which was plugged and backfilled with soil/gravel on August 16, 1994, per the *Underground Test Area Borehole Index* (DOE/NV, 2001b). The cellars range from approximately 2.7 to 3.6 m (9 to 12 ft) in diameter with a depth range of approximately 2.7 to 4.5 m (9 to 15 ft). The cellar floors contain an unknown amount of soil with small amounts of organic material and possible drilling material. The walls of the cellars are lined with corrugated steel with the exception of CAS 20-37-01, which is lined with a square metal casing.

According to historical documentation and prior interviews, exploratory holes were drilled in order to determine a location suitable for underground testing. After a site was selected, holes were drilled for emplacement of the nuclear device and instrumentation. Prior to testing, a cellar was excavated and lined with corrugated metal pipe to house the containment equipment. The postshot hole was then drilled to approximately 30 to 36.6 m (100 to120 ft) below ground surface. The hole was filled with water and the abandonment valve installed and closed until after the test is completed. After a test was completed, postshot drilling was accomplished in order to reenter the test cavity to obtain gas samples and puddle glass (i.e., melted rock and materials which cooled and solidified at the bottom of the test cavity). Postshot drilling was also used to determine cavity size, chimney dimensions, the effects of the explosion on the surrounding material, and the distribution of radioactivity in the test area. Drilling muds were never disposed of in cellars; however, drilling equipment was washed over the cellar. Therefore, cellars can contain the same contaminants of concern (COCs) found in drilling muds. Additionally, leaded pipe dope was used to connect drill casing. This represents an additional source of lead within the cellar.

Soil samples were collected by BN at CASs 20-23-02, 20-23-03, 20-23-05, 20-23-06, 20-37-05, and 20-37-01 on April 18 and 23, 2002. Samples were collected from the bottom of each cellar

floor, which contained a mixture of soil and organic material, and some CASs contained small amounts of possible drilling mud. All samples were analyzed for VOCs, SVOCs, TPH full scan, PCBs, total RCRA metals, and gamma spectroscopy.

CAS 20-23-02; analytical results indicate a presence of TPH diesel/oil range (2,880 mg/kg).
CAS 20-23-03; analytical results indicate a presence of TPH diesel/oil range (5,330 mg/kg).
CAS 20-23-05; analytical results indicate a presence of TPH diesel/oil range (3,060 mg/kg).
CAS 20-23-06; analytical results indicate a presence of TPH oil range (230 mg/kg).
CAS 20-37-01; analytical results indicate a presence of TPH oil range (250 mg/kg).
CAS 20-37-05; analytical results indicate a presence of TPH oil range (3,700 mg/kg).

All other analytical results for samples collected at the CASs were below regulatory levels. Radiological surveys of all the sites were also conducted and the results indicated levels of radiation to be at NTS background levels.

CAS 20-23-04 is backfilled with soil/gravel. The sampling method for this cellar was different from the other cellars. BN personnel used a Geoprobe® to determine how deep the cellar was. Most cellars have a concrete bottom. The Geoprobe® cannot push the drive rod through concrete. Refusal occurred at a depth of 4 m (13 ft). On March 27, 2002, a composite sample was collected from the fill material in the cellar. The composite represented fill material taken from the ground surface and every foot thereafter to a depth of 4 m (13 ft). Results of samples collected from the cellar fill were below regulatory levels and PRGs for industrial soils. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels. Based on results from the other cellars it is highly likely that this cellar also contains TPH concentrations which exceed regulatory limits.

1.3 Develop and Refine the Conceptual Site Model

The Conceptual Site Models (CSMs) are considered the most probable scenarios for current conditions at the CAU 358 sites. Available information from which the CSMs are based were derived from process knowledge, related sites, site investigation, and environmental sampling analysis results. All of the sites are expected to fit the basic CSMs which pertain to that particular CAS with minor variations (Figures 2 through 9 in the main text of this plan).

An important element of a CSM is the expected fate and transport of contaminants as they move through site media and where they can be expected in the environment. The expected fate and transport is based on distinguishing physical characteristics of the contaminants and media, such as solubility of the COC, density, and particle size of the media. Ultimately migration of contaminants to groundwater is limited by the geophysical properties such as permeability, porosity, and hydrologic conductivity. Groundwater contamination is not considered a likely scenario at CAU 358 based on the following information.

1.3.1 Primary CSMs

Area 2 and Area 3: Area 2 and Area 3 of the NTS are located in the Yucca Flat which lies within a highly faulted intermountain basin, typical of the Basin and Range Physiographic Province. The basin is surrounded by upland cenozoic volcanic, mesozoic plutonic, and

paleozoic sedimentary rocks. The erosion of upland material fills the basin and has created a layer of alluvium with an average thickness of approximately 300 m (984 ft) and some areas can be as thick as 2,000 m (6,560 ft) (Lawrence Livermore National Laboratory [LLNL], date unknown). The alluvium is made up of poorly sorted sands and silts with varying degrees of calcareous cementation. The alluvium is underlain by layers of non- to moderately welded ash-flow tuff with intermittent layers of bedded tuff. The tuffs overlie a unit of crypto- to medium crystalline dolostone, which comprises the carbonate aquifer. Beneath the carbonate unit is a unit of quartzite, which forms the lower clastic confining layers (BN, 1999). In addition, extension of subsurface materials has created a series of steeply angled fault planes throughout the Yucca Flat (LLNL, date unknown).

Static water levels within the Yucca Flat range from 326 to 495 m (1,069 to 1,625 ft) beneath the ground surface (U.S. Geological Survey [USGS], 1996a); however, beneath the eastern two-thirds of the Yucca Flat the static water levels range from 457 to 574.5 m (1,500 to 1,885 ft) beneath the ground surface (Desert Research Institute, 1998). Within Area 2 the approximate depth to groundwater is 442 m (1,450 ft) below surface level within the alluvium (USGS, 1996a). Within Area 3 the approximate depth to groundwater is 491 m (1,610 ft) beneath the ground surface (Wuellner, 1994). Groundwater within the eastern area of the Nevada Test Site, including Yucca Flat, flows southward toward the Ash Meadows Discharge area (DOE/NV, 1996). The aquifers within the Yucca Flat are divided into upper and lower units within each lithology. These include the upper aquifer and lower aquitard within the tuff unit and the upper and lower carbonate aquifers within the dolostone. Beneath the carbonate aquifers are two clastic aquitards of Paleozoic age (USGS, 1996b).

Area 12: Tunnel U12b is located on the eastern edge of Rainier Mesa in Area 12. Stratigraphically, the mesa consists of Tertiary volcanic tuffs unconformable over Cambrian/Precambrian schist and quartzite, Paleozoic carbonates, or Cretaceous granitic rocks. The volcanic tuff sequence is approximately 610 to 1,524-m (2,000 to 5,000-ft) thick and consists of welded ash flow tuffs, friable vitric bedded-tuff, and zeolitized-bedded tuffs. Rainier Mesa is capped with a 30 to 122-m (100 to 400-ft) thick moderate to densely-welded, vitric, ash flow tuff called the Rainier Mesa Tuff overlying over 60 to 244 m (200 to 800 ft) of friable, vitric, ash flow, and bedded ash flow tuff that is Miocene in age. Beneath the vitric tuffs are approximately 183 to 914 (600 to 3,000 ft) of zeolitized bedded tuff with one or two thin, interbedded welded to nonwelded ash flow tuff units that are Miocene and Oligocene in age. The tunnels are mined into the zeolitized tuffs which are located approximately 259 to 427 m (850 to 1,400 ft) below the mesa surface (Defense Nuclear Agency [DNA], 1990; USGS, 1990).

The hydrology is controlled by the rock type. Groundwater flow through the welded, vitric ash flow tuffs is primarily through joints and fractures; whereas, flow through the vitric bedded tuffs is through the pore spaces. The zeolitized bedded tuff is a fractured aquitard with high porosity (approximately 30 percent) and low permeability. Due to the zeolitization, the interstitial permeability is zero. The fractures within this unit are not interconnected well. Groundwater migration within this unit is primarily downward along steeply dipping fractures and faults. Underlying the zeolitized tuffs is a far more permeable Paleozoic carbonate unit which is the main aquifer for the area and is where the regional water table resides. The older units below the Paleozoic carbonates act as another aquitard controlling the flow of water into and out of the regional water table. The depth to the groundwater table is approximately 914 to 1,067 m

(3,000 to 3,500 ft) beneath the mesa surface or 457 to 610 m (1,500 to 2,000 ft) below the tunnels. The Paleozoic carbonate unit eventually discharges into the Ash Meadows discharge basin (DNA, 1990).

Area 18: Area 18 lies within the northeastern part of the Timber Mountain caldera moat, which is made up of the Rainier Mesa Tuff and the Ammonia Tanks Member. The Rainier Mesa Tuff was erupted from vents above a magma chamber within Timber Mountain caldera. The eruption deposited the ash-flow tuff of the Rainier Mesa Tuff inside the caldera at a thickness of greater than 610 m (2,000 ft). The debris flows and breccia from the Rainier Mesa Tuff are a mixture of dense, hard rhyolite lava and welded tuff blocks in a matrix of porous, soft, ashy tuff, now altered largely to clay. The maximum known thickness is 259 m (850 ft).

The Ammonia Tanks Tuff is divided into two parts based on compositional and inferred cooling breaks. The lower part of the Ammonia Tanks Tuff is densely welded and very thick (e.g., more than 610 m (2,000 ft) on the Timber Mountain resurgent dome). The lower part is also greatly restricted outside the caldera. The upper part of the Ammonia Tanks Tuff is less densely welded, less than 244 m (800 ft) thick, and extends outside the caldera especially on Pahute Mesa. The ash-fall and non-welded tuff unit generally includes tuff between the Ammonia Tanks Tuff and the overlying gravel and tuffaceous sediments. A mass of ash-fall and non-welded tuff is also inferred to underlie Buckboard Mesa.

The trachybasalt lavas of Buckboard Mesa rest unconformably on a sloping, graded alluvial surface cut on the gravel and tuffaceous sediments. Two lava flows separated by scoria and cinders underlie most of Buckboard Mesa and have a maximum thickness of 76 m (250 ft). The northeastern part of the caldera moat has been undergoing erosion by Fortymile Canyon and its tributaries since the trachybasalt of Buckboard Mesa was extruded 2.8 million years ago (USGS, 1981). The static water level near CAS 18-09-01 is reported at 416 m (1,365 ft) beneath surface.

Areas 19 and 20: Areas 19 and 20 lie within the eastern part of Pahute Mesa, which is a volcanic plateau underlain by tuffs and lavas from the Timber Mountain Oasis Valley caldera complex and the Silent Canyon and Black mountain calderas north of Timber Mountain. A Miocene, rhyolitic, eruptive center produced this overlapping complex of fault-controlled calderas (DOE/NV, 1996). The major subsurface of Pahute Mesa is the Silent Canyon caldera, which is a deep structural depression. This caldera is comprised of different types of Tertiary volcanic rocks such as ash-flow and ash-fall tuffs. These tuffs are more than 3,962 m (13,000 ft) thick in some places (DOE/NV, 1988).

Inside the caldera the depth of the water table ranges from 594.4 to 716.3 m (1,950 to 2,350 ft). Outside of the caldera the depth decreases to around 259 m (850 ft) in the extreme northwest corner of the NTS. The permeability of the rock is generally low, and groundwater movement is primarily through fractures in the rock. The total flow of groundwater beneath Pahute Mesa is estimated to be about 8,000 acre-ft/year, of which 5,500 acre-ft enters the ground water system from Gold Flat and Kawich Valley to the north. Groundwater flow is generally south and southwest to the Oasis Valley, about 20 miles away (DOE/NV, 1988).

The sites are all located on the NTS which is one of the most arid regions of the country. There are no surface water features or expression of erosional activity at any of the CASs. Additionally, all of the mud pits are bermed and all of the cellars are below ground surface and lined with metal. Therefore, COCs will not likely be transmitted through the environment by surface water movement.

The CASs within CAU 358 are all located within Areas 2, 3, 12, 18, 19, and 20. Areas 2, 3, 12, 19 and 20 are all designated as weapons test zones. Area 18 has been used for nuclear tests in the past and is currently a reserved zone (DOE/NV, 1996). Because of the unique nature of the historic activities performed at these sites, access will likely be further controlled from any use other than nuclear testing or weapons testing. Therefore, there will be no uncontrolled contact with the CASs in CAU 358 by NTS personnel and no contact by members of the public.

1.3.2 CAS Specific Variations to the Primary CSMs

The proposed activities are based on the assumption that diesel- and oil- range petroleum hydrocarbons are the most prevalent COPCs at the sites. All of the sites are expected to fit the basic CSMs pertaining to that particular CAS with minor variations caused by site-specific preferential pathways, as identified below for each CAS:

- CAS 02-99-01, Oil Stained Dirt on Concrete: The primary CSM, based on sample analysis results, assumes that only petroleum hydrocarbons were released to the soil. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 2 (See Figure 2 in main text of plan).

- CAS 03-22-33, Bucket; Spill; Debris: The primary CSM has been developed for this site even though sample analysis indicated that COCs are not present above regulatory levels. The spill (magnetite) is located on the surface and there are no preferential pathways identified for this site based on the geohydrology previously described for Area 3 (See Figure 3 in main text of plan).

- CAS 03-99-04, Spill: The primary CSM assumes that petroleum hydrocarbons and associated COCs (several SVOCs) were released to the soil and that the COCs did not extend beyond the limits of the immediate soil beneath the epoxy tar release. Past clean-up activities with epoxy tar sites did not contain COCs beyond an approximate depth of 15.2 cm (6 in) for subsurface soils. Sample analysis supports this model and indicates that petroleum hydrocarbons and SVOCs are limited to the pieces of epoxy tar/associated soils at approximately 15.2 cm (6 in) below ground surface. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 3 (See Figure 4 in main text of plan).

- CAS 12-30-02, Drill Holes: A CSM has been developed for this site even though sample analysis from the mound indicated that COCs are not present above regulatory levels. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 3 (See Figure 5 in main text of plan).

- CAS 18-09-01, Mud Pit: The primary CSM assumes that no petroleum hydrocarbons were released from the bucket. Also associated with this CAS is a small surface area containing broken pieces of alkaline batteries (Figure 6 of main text) which have released small amounts of mercury to the surface soil. The CSM assumes all released mercury is within 2.5 cm (1 in) of the surface.

- CAS 19-09-05, Mud Pit: The primary CSM assumes that only petroleum hydrocarbons were released in the mud. Sample analysis supports this CSM and indicates that the COCs extend to a maximum of 30.5 cm (12 in) in depth but are confined to the mud in the mud pit and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 19 (See Figure 7 main text of plan).

- CAS 19-09-06, Mud Pit: The CSM is that there are no COCs on this site. This is supported by the analytical data from the drilling mud. If COCs were present, there are no preferential pathways identified for this site based on the geohydrology previously described for Area 19.

- CAS 19-09-07, Mud Pit: The CSM is that there are no COCs on this site. This is supported by the analytical data from the drilling mud. If COCs were present, there are no preferential pathways identified for this site based on the geohydrology previously described for Area 19.

- CAS 20-09-08, Mud Spill: The CSM is that there are no COCs on this site. This is supported by the analytical data from the drilling mud. If COCs were present, there are no preferential pathways identified for this site based on the geohydrology previously described for Area 19.

- CAS 20-23-02, Postshot Cellar: The primary CSM assumes that petroleum hydrocarbons were released to the cellar floor. Sample analysis supports this CSM and indicates that the COCs (TPH diesel/oil range) are confined to the cellar floor and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 20 (See Figure 9 main text of plan).

- CAS 20-23-03, Cellar: The primary CSM assumes that petroleum hydrocarbons were released to the soil. Sample analysis supports this CSM and indicates that the COCs (TPH diesel/oil range) are confined to the cellar floor and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 20 (See Figure 9 main text of plan).

- CAS 20-23-04, Postshot Cellar: The primary CSM assumes that petroleum hydrocarbons were released to the cellar floor. Sample analysis did not confirm this assumption however, it is probable that the cellar floor is no different from the other cellars within CAU 358. A representative sample of the cellar floor could not be acquired without removing all of the clean fill from the cellar. COCs (TPH diesel/oil range) are confined

to the cellar floor and pose no threat to human health or the environment based on the geohydrology previously described for Area 20 (See Figure 8 main text of plan).

- CAS 20-23-05, Postshot Cellar: The primary CSM assumes that petroleum hydrocarbons were released to the cellar floor. Sample analysis supports this CSM and indicates that the COCs (TPH diesel/oil range) are confined to the cellar floor and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 20 (See Figure 9 main text of plan).

- CAS 20-23-06, Cellar: The primary CSM assumes that petroleum hydrocarbons were released to the cellar floor. Sample analysis supports this CSM and indicates that the COPCs (TPH oil range) are confined to the cellar floor and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 20 (See Figure 9 main text of plan).

- CAS 20-37-01, Cellar and Mud Pit: The primary CSM assumes that petroleum hydrocarbons were released to the cellar floor. Sample analysis supports this CSM and indicates that the COPCs (TPH oil range) are confined to the cellar floor and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 20 (See Figure 9 main text of plan).

- CAS 20-37-05, Cellar: The primary CSM assumes that petroleum hydrocarbons were released to the soil. Sample analysis supports this CSM and indicates that the COPCs (TPH oil range) are confined to the cellar floor and pose no threat to human health or the environment. There are no preferential pathways identified for this site based on the geohydrology previously described for Area 20 (See Figure 9 main text of plan).

1.3.3 Alternate CSMs

The conditions under the alternate CSM are considered less likely than conditions outlined in the primary CSMs.

- CAS 02-99-01, Oil Stained Dirt on Concrete: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 03-22-33, Bucket; Spill; Debris: An alternate CSM is not necessary for this site because sample analysis indicated that COCs are not present above regulatory levels.

- CAS 03-99-04, Spill: The alternate CSM provides for a more extensive petroleum hydrocarbon and SVOC release than assumed in the primary CSM.

- CAS 12-30-02, Drill Holes: An alternate CSM is not necessary for this site because sample analysis indicated that COCs are not present above regulatory levels.

- CAS 18-09-01, Mud Pit: The alternate CSM provides for a more extensive petroleum hydrocarbon release that has impacted soil underneath the bucket of material, and/or a more extensive release of mercury to soil underneath the battery pieces than assumed in the primary CSM.

- CAS 19-09-05, Mud Pit: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 19-09-06, Mud Pit: An alternate CSM is not necessary for this site because sample analysis indicated that COPCs are not present above regulatory levels.

- CAS 19-09-07, Mud Pit: An alternate CSM is not necessary for this site because sample analysis indicated that COPCs are not present above regulatory levels.

- CAS 20-09-05, Mud Pit: An alternate CSM is not necessary for this site because sample analysis indicated that COPCs are not present above regulatory levels.

- CAS 20-09-08, Mud Spill: An alternate CSM is not necessary for this site because sample analysis indicated that COPCs are not present above regulatory levels.

- CAS 20-23-02, Postshot Cellar: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 20-23-03, Cellar: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 20-23-04, Postshot Cellar: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 20-23-05, Postshot Cellar: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 20-23-06, Cellar: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 20-37-01, Cellar and Mud Pit: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

- CAS 20-37-05, Cellar: The alternate CSM provides for a more extensive petroleum hydrocarbon release than assumed in the primary CSM.

2.0 IDENTIFY THE DECISION

In this step, the principal study question will be made into a decision statement that will address the problem as previously described.

2.1 Identify the Principal Study Question

The principal study question is, "Does any CAS within CAU 358 pose an unacceptable risk to human health/environment?"

2.2 Alternative Actions that Could Result from Resolving the Principal Study Question

The possible actions that may result include:

- Clean closure of the site based on unacceptable risk to human health or the environment.
- No further action with administrative controls based on unacceptable risk to human health for potential future site workers.
- No further action based on an acceptable risk to human health and the environment.

2.3 Decision Statement

Combining the principal study question with the alternative actions generates the following decision statement:

"Determine if the CASs within CAU 358 have a risk to human health or the environment and thus require some type of corrective action."

3.0 IDENTIFY THE INPUTS TO THE DECISION

3.1 Information Required to Resolve the Decision Statement

Relevant information that bears on the decision statement will be defined on a case by case basis. The relevant information will clarify the nature and extent of COCs at each site. This will include process knowledge, information from similar sites, and analytical sampling using an appropriate analytical method for potential COCs at each CAS. The future land use and potential receptors must be identified. Any missing data relevant to the decision statement must also be identified.

General information that applies to each CAS includes the U.S. EPA Region IX PRGs (EPA, 2002) for industrial soils to aid in the determination of risk to human health and the environment, and Nevada Administrative Code (NAC) Section 445A.2272 for action levels for petroleum hydrocarbons (NAC, 2002b).

3.2 List types of COCs and affected media.

The CASs and their associated COCs are listed below:

- CAS 02-99-01, Oil Stained Dirt on Concrete - TPH as diesel/oil range
- CAS 03-22-33, Bucket; Spill; Debris - No COPCs above action levels

- CAS 03-99-04, Spill - TPH as diesel/oil range, SVOCs
- CAS 12-30-02, Drill Holes - No COPCs above action levels
- CAS 18-09-01, Mud Pit - TPH as diesel/oil range (mercury-impacted material in mud pit only)
- CAS 19-09-05, Mud Pit - TPH as diesel/oil range
- CAS 19-09-06, Mud Pit - No COCs above action levels
- CAS 19-09-07, Mud Pit - No COCs above action levels
- CAS 20-09-05, Mud Pit - No COCs above action levels
- CAS 20-23-02, Postshot Cellar - TPH as diesel/oil range
- CAS 20-23-03, Cellar - TPH as diesel/oil range
- CAS 20-23-04, Postshot Cellar - No COCs above action levels
- CAS 20-23-05, Postshot Cellar - TPH as diesel/oil range
- CAS 20-23-06, Cellar - TPH as oil range
- CAS 20-37-01, Cellar and Mud Pit - TPH as oil range (cellar only)
- CAS 20-37-05, Cellar - TPH as oil range

For all of the CASs, the affected media is soil and/or drilling mud. Table 2 provides a summary of the sample analytical data.

3.3 Identify potential sampling approaches and appropriate analytical methods

3.3.1 CAS 02-99-01: Oil Stained Dirt on Concrete

Process knowledge coupled with a test for magnetism is adequate to determine the nature of the magnetite spill. No further information is required to adequately address the decision statement. There is a data gap that exists for the hydrocarbon spill. The nature of the spill is known, however the extent has not been determined. The extent can be determined using a field screening method developed by PetroFLAG®. This method has been used extensively on other CAS at the NTS and produces conservative results for the presence of petroleum hydrocarbons in soil. After the limits of the petroleum hydrocarbons have been identified, confirmatory samples collected and analyzed for TPH using analytical method 8015 modified (EPA, 1996) are adequate to confirm the PetroFLAG® results and verify that the impacted soils have been removed.

3.3.2 CAS 03-22-33: Bucket; Spill; Debris

Sampling was conducted by IT on August 27, 1997, on the pile of magnetite material. Additional soil samples were collected by BN from two different locations of the magnetite material on June 8, 2001. The results indicated that the magnetite material contained no COCs above regulatory levels (Table 2). A radiological survey of the site using field screening tools was also conducted and the results indicated levels of radiation to be at background levels.

Historical information about this site is limited. It is unknown where the material came from; however, magnetite was generally used as emplacement hole plug back material during testing activities. No additional samples are required to adequately address the decision statement.

TABLE 2 - CAU 358 SAMPLE ANALYTICAL RESULTS

SAMPLE IDENTIFICATION NUMBER	DIESEL (mg/kg)[a]	OIL (mg/kg)	GASOLINE (mg/kg)	TPH[b] (mg/kg)	VOCs[c] (µg/kg)[d]	SVOC[e] (µg/kg)	Total RCRA METALS (mg/kg)	PCBs[g] (µg/kg)	GAMMA SPECTROSCOPY (pCi/g)[h]
ACTION LEVEL	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**EPA PRGs**	**EPA PRGs**	**EPA PRGs**	**1 µg/kg**	**NTS Background**
CAS 02-99-01 (SDG[i] V1147) and (ERS 00049 [IT])									
029901-0-1	NS[j]	NS	NS	NS	NS	NS	< Action levels	NS	< Background levels
ERS00049	250	1,100	NS	1,350	< Action levels	< Action levels		< Action levels	
CAS 03-22-33 (SDG V1147 and V1212) and (ERS 00104 [IT])									
032233-0-1	NS	NS	NS	NS	NS	NS	< Action levels	NS	< Background levels
032233-0-2	NS	NS	NS	NS	NS	NS		NS	
032233-0-2A,B	NS	NS	NS	NS	NS	NS		NS	NS
ERS00104	25	42	NS	67	< Action levels	< Action levels		< Action levels	< Background levels
CAS 03-99-04 (SDG V1154 and V1155)									
039904-0-1	610	2,900	ND[k]	3,510	< Action levels	Six above action levels (See Table 1)	< Action levels	< Action levels	< Background levels
CAS 12-30-02 (SDG V1562 and V1563)									
123002-0-M1	ND	ND	ND	ND	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
123002-0-M2	ND	ND	ND	ND					

TABLE 2 - CAU 358 SAMPLE ANALYTICAL RESULTS (continued)

SAMPLE IDENTIFICATION NUMBER	DIESEL (mg/kg)[a]	OIL (mg/kg)	GASOLINE (mg/kg)	TPH[b] (mg/kg)	VOCs[c] (µg/kg)[d]	SVOC[e] (µg/kg)	(Total) RCRA METALS (mg/kg)	PCBs[g] (µg/kg)	GAMMA SPECTROSCOPY (pCi/g)[h]
ACTION LEVEL	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**EPA PRGs**	**EPA PRGs**	**EPA PRGs**	**1 µg/kg**	**NTS Background**
CAS 18-09-01 (SDG V1426 and V1427)									
180901-0-1MP	ND	15	ND	15	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
180901-1-1MP	ND	58	ND	58					
180901-0-2MP	ND	44	ND	44					
180901-1-2MP	ND	68	ND	68					
180901-0-3B	48,000	190,000	ND	238,000					
180901-0-4	NS	NS	NS	NS	NS	NS	Mercury - 7.0 All others < Action levels	NS	NS
CAS 19-09-05 (SDG V1431 and V1433)									
190905-0-1MP	138	970	ND	1,108	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
190905-6-1MP	17	150	3.5	170.5					
190905-0-2MP	15	170	3.2	188.2					
190905-1-2MP	22	170	ND	192					

TABLE 2 - CAU 358 SAMPLE ANALYTICAL RESULTS (continued)

SAMPLE IDENTIFICATION NUMBER	DIESEL (mg/kg)[a]	OIL (mg/kg)	GASOLINE (mg/kg)	TPH[b] (mg/kg)	VOCs[c] (µg/kg)[d]	SVOC[e] (µg/kg)	(Total) RCRA METALS (mg/kg)	PCBs[g] (µg/kg)	GAMMA SPECTROSCOPY (pCi/g)[h]
ACTION LEVEL	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**EPA PRGs**	**EPA PRGs**	**EPA PRGs**	**1 µg/kg**	**NTS Background**
CAS 19-09-06 (SDG V1439 and V1440)									
190906-0-1MP	ND	14	ND	14	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
190906-0-2MP	ND	ND	ND	ND					
190906-0-3MP	ND	ND	ND	ND					
190906-2-3MP	ND	ND	ND	ND					
190906-0-4MP	ND	ND	ND	ND					
190906-3-4MP	ND	ND	ND	ND					
CAS 19-09-07 (SDG V1433 and V1434)									
190907-0-1MP	ND	ND	ND	ND	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
190907-9-1MP	ND	ND	ND	ND					
190907-0-2MP	ND	ND	ND	ND					
190907-1-2MP	ND	ND	ND	ND					
190907-0-3M	ND	ND	ND	ND					
190907-0-4M	ND	ND	ND	ND					
190907-0-5M	ND	ND	ND	ND					
190907-0-0M	ND	ND	ND	ND					

TABLE 2 - CAU 358 SAMPLE ANALYTICAL RESULTS (continued)

SAMPLE IDENTIFICATION NUMBER	DIESEL (mg/kg)[a]	OIL (mg/kg)	GASOLINE (mg/kg)	TPH[b] (mg/kg)	VOCs[c] (µg/kg)[d]	SVOC[e] (µg/kg)	(Total) RCRA METALS (mg/kg)	PCBs[c] (µg/kg)	GAMMA SPECTROSCOPY (pCi/g)[h]
ACTION LEVEL	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**EPA PRGs**	**EPA PRGs**	**EPA PRGs**	**1 µg/kg**	**NTS Background**
CAS 20-09-05 (SDG V1439 and V1440)									
209005-0-1MP	ND	40	ND	40	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
CAS 20-09-08 (SDG V1426 and V1427)									
200908-0-0	ND	ND	ND	ND	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
200908-0-1	ND	ND	ND	ND					
209008-0-2	ND	23	ND	23					
CAS 20-23-02 (SDG V1559 and V1560)									
202302-9-C1	280	2,600	ND	2,880	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
CAS 20-23-03 (SDG V1550 and V1551)									
202303-12-C1	430	4,900	ND	5,330	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
CAS 20-23-04 (SDG V1508, V1509, and V1560)									
2304-(0-13)-C1	ND	17	ND	17	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels

TABLE 2 - CAU 358 SAMPLE ANALYTICAL RESULTS (continued)

SAMPLE IDENTIFICATION NUMBER	DIESEL (mg/kg)[a]	OIL (mg/kg)	GASOLINE (mg/kg)	TPH[b] (mg/kg)	VOCs[c] (µg/kg)[d]	SVOC[e] (µg/kg)	(Total) RCRA METALS (mg/kg)	PCBs[g] (µg/kg)	GAMMA SPECTROSCOPY (pCi/g)[h]
ACTION LEVEL	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**100 mg/kg**	**EPA PRGs**	**EPA PRGs**	**EPA PRGs**	**1 µg/kg**	**NTS Background**
CAS 20-23-05 (SDG V1550 and V1551)									
202305-10-C1	360	2,700	ND	3,000	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
CAS 20-23-06 (SDG V1550 and V1551)									
202306-9-C1	18	230	ND	248	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
CAS 20-37-01 (SDG V1541, V1542, V1550, and V1551)									
203701-9-C1	40	250	ND	290	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels
203701-2-M1	ND	ND	ND	ND					
203701-2-M2	ND	ND	ND	ND					
CAS 20-37-05 (SDG V1559 and V1560)									
203705-12-C1	35	3,700	0.11	3,735.1	< Action levels	< Action levels	< Action levels	< Action levels	< Background levels

[a]milligram(s) per kilogram
[b]total petroleum hydrocarbons
[c]volatile organic compoun
[d]microgram(s) per kilogram
[e]semivolatile organic compounds
[f]milligram(s) per liter
[g]polychlorinated biphynels.
[h]picoCurie(s) per gram
[i]sample delivery group
[j]not sampled
[k]not detected or less than detection limits

3.3.3 CAS 03-99-04, Spill

Soil samples of the epoxy tar/associated soil were collected by BN on June 11, 2001. The results indicated that the COPCs were TPH-diesel/oil range (3,510 mg/kg) and several SVOCs above the PRGs (Table 2). All other analytical results of the epoxy tar spill were below regulatory levels. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels.

Historical information about this site is limited. It is unknown where the epoxy tar came from; however, epoxy tar was used as emplacement hole plug back material during testing activities, similar to magnetite. Therefore, this epoxy tar is likely excess material that was discarded following plug back operations in Area 3. Sample results from the epoxy tar are consistent with results from other epoxy tar sites (CASs 02-99-02, 02-99-03, 03-99-01, 03-99-03, 03-99-06, 03-99-08, 07-99-03 closed in CAU 387). The extent of tar-impacted soil is easily discerned with the naked eye; therefore, no samples are required. The SVOCs can leach from the epoxy tar into the soil. Previous verification sampling at the CASs within CAU 387 indicates that the SVOCs do not leach beyond the uppermost six inches of soil in contact with the epoxy tar. No more samples are required to adequately address the decision statement. However, a data gap exists regarding the amount of SVOC-impacted soil affected by the epoxy tar. Confirmatory samples collected from beneath the epoxy tar spill and analyzed using analytical method 8270 (EPA, 1996) are adequate to determine the depth of SVOC-impacted soil if this is deemed necessary.

3.3.4 CAS 12-30-02, Drill Holes

BN collected samples from two locations on April 24, 2002, from the mound at the surface. The analytical results indicated that the mound contained no COCs above regulatory levels. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels.

Based on past site visits, historical documentation, and interviews, the mound is covering nine plugged instrumentation drill holes and one plugged exploratory drill hole with miscellaneous housekeeping debris in the area. An interviewee indicated that the mound was reportedly created to contain leakage of radioactive gases. According to the *Underground Test Area Borehole Index* documentation, all the drill holes associated with CAS 12-30-02 are plugged and/or grouted under the 2.4 m (8 ft) of fill (DOE/NV, 2001b). No further sampling is required to adequately address the decision statement.

3.3.5 CAS 18-09-01, Mud Pit

Drilling mud samples were collected by BN at CAS 18-09-01 on February 7, 2002. The analytical results for the drilling mud indicate that the mud in the mud pits contains no COCs above regulatory levels.

A sample was also collected from the drilling mud in the vicinity of broken up pieces of alkaline batteries. Analytical results indicated that the drilling muds in the vicinity of the broken pieces of batteries contained mercury at levels above the PRGs. After excavation of the drilling mud from the area of the broken battery pieces, two verification samples will be collected from the

excavated area and analyzed for mercury (method 7471A [EPA, 1996]). A final sample was taken from the material inside the bucket of what is believed to be a lead-based pipe dope. The analytical sample results of the material indicated a presence of TPH diesel/oil range (238,000 mg/kg). It is not clear if the contents in the bucket have impacted the drilling mud in the vicinity of where the bucket is located. Radiological surveys on the site were also conducted and the results indicated levels of radiation to be at background levels. The drilling mud in the vicinity of the bucket should be sampled (method 6010 [EPA, 1996]) to verify that the bucket contents have not impacted the mud.

3.3.6 CAS 19-09-05, Mud Pit

Soil samples were collected by BN at CAS 19-09-05 on February 11, 2002. Analytical results indicated a presence of TPH diesel/oil range (1,108 mg/kg) for surface and TPH oil range (150 mg/kg) at a 15-cm (6-in) depth at one location. At the second location in the same mud pit, soil samples were also collected at the surface and at a depth of 30.5 cm (12 in). Analytical results indicated a presence of TPH oil range (170 mg/kg) at both the surface and at a 30.5 cm (12 in) depth. All other analytical results for samples collected were below regulatory limits. Radiological surveys on the site were also conducted and the results indicated levels of radiation to be at background levels. No additional sampling is required to adequately address the decision statement. An A through K evaluation, pursuant to NAC Section 445A.227 (NAC, 2002a), is presented in Section 3.3.8 below to demonstrate the low risk associated with this mud pit.

3.3.7 CASs 19-09-06, 19-09-07, 20-09-05, 20-09-08, and 20-37-01, Mud Pits and Mud Spill

Soil samples were collected by BN at 19-09-06, 19-09-07, 20-09-05, 20-09-08 (mud spill), and 20-37-01 on February 7, 12 and 13, and April 17, 2002. Samples were collected from the surface mud and/or depths ranging from the surface down to 1 m (3 ft). The analytical results for these sites indicate that the mud in the mud pits and the mud spill contain no COCs above regulatory levels. Radiological surveys of the sites were also conducted, and the results indicated levels of radiation to be at background levels.

Drilling muds are recirculated as a borehole is drilled. Therefore, the drilling mud in the mud pits is relatively homogeneous. Sample results for the drilling mud indicates that within mud pits little to no variation exists between the samples. This supports the supposition of mud pit homogeneity. Calculating the standard deviation for chromium data and using a 95 percent confidence interval, the number of samples required to establish the average concentration of chromium for the mud pits is two (Sample size "n" was calculated from a 1-sample T test). All of the mud pits were sampled at least twice excluding one site, CAS 20-09-05. A test for equal variances indicates that the drilling mud populations within CAU 358 are not statistically different. Based on this test, mud pits can be considered as part of the same population. In theory, a total of two samples collected from the mud pits would be sufficient to characterize the all of these mud pit. To date, over ten times this number of sample have been collected and analyzed; implying the mud pits as a group have been well characterized. This finding makes sense given that drilling practices were established by a subcontractor, implying that the drilling materials and practices were consistent. No additional sampling is required to adequately address the decision statement.

3.3.8 CASs 20-23-02, 20-23-03, 20-23-04, 20-23-05, 20-23-06, 20-37-05, and 20-37-01, Cellars

Soil samples were collected by BN at CASs 20-23-02, 20-23-03, 20-23-05, 20-23-06, 20-37-05, and 20-37-01 on April 18 and 23, 2002. Samples were collected at the bottom of each cellar floor, which contained a mixture of soil, organic material, and some CASs contained small amounts of possible drilling mud. Sample analytical results indicate the following:

- CAS 20-23-02, analytical results indicate a presence of TPH diesel/oil range (2,880 mg/kg).
- CAS 20-23-03, analytical results indicate a presence of TPH diesel/oil range (5,330 mg/kg).
- CAS 20-23-05; analytical results indicate a presence of TPH diesel/oil range (3,060 mg/kg).
- CAS 20-23-06, analytical results indicate a presence of TPH oil range (230 mg/kg).
- CAS 20-37-01, analytical results indicate a presence of TPH oil range (250 mg/kg).
- CAS 20-37-05, analytical results indicate a presence of TPH oil range (3,700 mg/kg).

All other analytical results for samples collected at the CASs were below regulatory limits. Radiological surveys of all the sites were also conducted and the results indicated levels of radiation to be at background levels.

CAS 20-23-04 is backfilled with soil/gravel. On March 27, 2002, a composite sample was collected from the fill material in the cellar. Results of the sample collected from the cellar fill were below regulatory levels. However, it is assumed that this cellar also has elevated TPH within the range of the other cellars as previously described. A radiological survey of the site was also conducted and the results indicated levels of radiation to be at background levels. Based on results from the other cellars it is highly likely that this cellar also contains TPH concentrations which exceed regulatory limits.

Only one set of samples has been collected from each of the cellars. In order to prove statistical significance, at least two samples must be collected from a population. This presupposes each cellar should be considered as an independent population. There are only a few thousand parts per million variation in the sampling results for COCs which were above method detection limits. Both the lack of variation in the sample data and process knowledge indicate that the cellars are not independent and are in fact part of the same population. An A through K evaluation, pursuant to NAC 445A.227 (NAC, 2002a), is presented below to demonstrate the low risk associated with the cellar CASs and mud pit CAS 19-09-05.

Depth to Groundwater (A)
The depth to groundwater for each area has been previously described in Section 1.3.1. Depth to groundwater in Area 20, which contains all of the cellars within this CAU, ranges from 594 to 716 m (1,950 to 2,350 ft) below ground surface. The sites are all located within the Grouse Canyon and Area 20 Caldera (DOE/NV, 1988).

Distance to Irrigation or Drinking Water Wells (B)
The nearest water well to the Area 20 cellars and to CAS 19-09-05 mud pit is the U-20 water well. This well is a construction water well and does not supply water for potable uses. The depth to water in this well is 627 m (2,058 ft) below ground surface (USGS, 1996). Listed below are the CASs with COCs and their distance from U-20 water well:

CAS 19-09-05	10,217 m (33,521 ft)
CAS 20-23-02	4,227 m (13,870 ft)
CAS 20-23-03	2,685 m (8,809 ft)
CAS 20-23-04	2,418 m (7,932 ft)
CAS 20-23-05	2,950 m (9,680 ft)
CAS 20-23-06	491 m (1,612 ft)
CAS 20-37-01	7,769 m (25,488 ft)
CAS 20-37-05	5,323 m (17,463 ft)

Type of Soil (C)
The soil at the Area 20 cellars and at CAS 19-09-015 mud pit consists of eroded welded, vitric ash flow tuffs. These soils are underlain by the tuffs themselves.

Annual Precipitation (D)
The sites are all located on the NTS which is one of the most arid regions of the country. There are no surface water features or expression of erosional activity at any of the CASs. The annual average precipitation for Pahute Mesa is 20.02 cm (7.88 in) (Pahute Mesa 1 monitoring station). This station has been monitored since 1964.

Type of Regulated Substance Released (E)
Oil and diesel range petroleum hydrocarbons are the only regulated substances that have been detected above action levels.

Extent of Contamination (F)
The cellar bottoms are lined with concrete. The extent of contamination is confined to the cellars themselves. For CAS 19-09-05, the extent of contamination is confined to the mud pit which measures approximately 29.5 by 24.6 m (97 by 81 ft) and is 0.3 m (1 ft) deep.

Present and Potential Land Use (G)
Areas 19 and 20 are all designated weapons test zones as previously discussed. Because of the unique nature of the historic activities performed at these sites, access will likely be further controlled from any use other than nuclear testing or weapons testing. Therefore, there will be no uncontrolled contact with the CASs in CAU 358 by NTS personnel and no contact by members of the public.

Preferred Routes of Migration (and Exposure Pathways of Concern) (H)
The only credible pathway for TPH to become mobile is by infiltrating precipitation. Based on the conditions and limited precipitation in Areas 19 and 20, migration of hydrocarbons from the sites is expected to be minimal. The concrete bottoms of the cellars will act as a barrier to this migration. The low permeability of the drilling mud will also inhibit TPH mobility.

Location of Structures or Impediments (I)
For the cellar sites impacted soil is contained within the cellar, a metal-cased, concrete floored structure.

Potential for a Hazard Related to Fire, Vapor, or Explosion(J)
No potential.

Other Factors Specific to the Sites (K)
For CAS 19-09-05 an additional consideration is that petroleum hydrocarbons in drilling mud are essentially immobile. Data from other mud pit sites supports the conclusion that TPH contamination within drilling mud does not migrate significantly. Data collected during the site characterization of CAU 417, The Central Nevada Test Area Surface, by IT and reported in Appendix D of the Corrective Action Decision Document (DOE/NV, 1998) supports the assertion that drilling muds which are primarily clays are effective at containing TPH. This prevents TPH contamination from spreading into underlying native material. IT characterized the UC-1 Central Mud Pit (CAS 58-09-01) which is composed of primarily bentonite clay contaminated with TPH, by sampling in 1997. Boreholes were drilled through the drilling mud and into the underlying native material. For all boreholes, the drilling mud was contaminated with TPH at levels up to 2,560 mg/kg, while the underlying material showed no TPH contamination at levels greater than the Nevada State Action Level of 100 mg/kg. TPH levels were essentially zero (not detected at the laboratory reporting limit) at depths of 0.3 m (1 ft) or more below the bottom of the mud pit.

Additionally, for the cellars sites the impacted soil is present at the base of the cellars, at approximately 3 to 3.6 m (10 to 12 ft) below ground surface. These cellars will be backfilled with clean fill when the associated boreholes are closed as part of the Borehole Management Program, thus eliminating the potential for contact with the contamination.

Based on an evaluation of the A through K criteria and information provided previously, no additional sampling is required to adequately address the decision statement for these CASs.

4.0 DEFINE THE BOUNDARIES OF THE STUDY

4.1 Define the geographic areas of the field investigation.

4.1.1 Define the geographic area within which all decisions must apply (in some cases this may be defined by the CAU).

The geographic areas of the field investigation are those areas of each CAS which are impacted by COCs as identified by the CSM. Descriptions of each area are found in Section 1.2 of this report. The boundaries in all cases are limited to the FFACO CAS description. The mud pit site boundaries are limited to the mud pits or potential affected media in the vicinity. The cellar site includes only the cellars. The boreholes within the cellars are under the control of the NNSA/NV Borehole Management Project. The current primary objective of the Borehole Management Project is to plug and abandon NTS legacy boreholes for which there is no future use. Plugging of these boreholes is consistent with the intent of the Safe Drinking Water Act and

in accordance with the Nevada Department of Conservation and Natural Resources Division of Water Resources, regulations for water well and related drilling, NAC Chapter 534 (NAC, 1998).

4.1.2 Specify the characteristics that define the population of interest.

The population of interest is the concentration of COCs associated with each CAS and its associated risk to human health and the environment.

4.2 Define the time frame of the decision.

4.2.1 Determine the time frame to which the study data apply.

- The study data should be relevant to the length of time allowed by the SAFER process under the FFACO (FFACO, 1996).

- Migration (if occurring) is assumed to be imperceptibly slow. This is based on minimal surface water infiltration and the constraints of the CSM.

4.2.2 Determine when to collect data.

Field activities are scheduled to take place after approval of the final SAFER Plan. A date for field activities has not been formally determined. Field activities will be conducted at times that meet the security and safety constraints of the NTS.

4.2.3 Define relevant time constraints.

The FFACO deadline for delivery of the final SAFER Plan is December 2, 2002. The FFACO deadline of delivery for the final CR has not been formally determined.

4.3 Identify any practical constraints on data collection.

- Approval of the DQO process and the SAFER Plan by the NDEP
- Site operations - NTS operational and security constraints
- Equipment and personnel access
- Sever meteorological conditions
- Availability of heavy equipment
- Health and safety of workers

5.0 DEVELOP A DECISION RULE - DEFINE A LOGICAL BASIS FOR CHOOSING AMONG ALTERNATIVE ACTIONS

5.1 Specify the action level or preliminary action level for the decision.

The action level is 100 mg/kg for TPH based on NAC 445A.2272 (NAC, 2002b). Based on Preliminary Remediation Goals EPA Region IX for Industrial Soils, the action levels for several

different SVOCs can be located in Table 1, Section 1.2.3. The action level for mercury is 0 mg/kg based on the 2002 EPA Region IX PRGs (EPA, 2002).

5.2 Basis for Choosing Alternative Actions

Alternative actions will be based on whether a COC exceeds an action level as described in Section 5.1. If an action level is exceeded, then future land use and potential impact to human health and the environment will be considered. If COCs exceed action levels and future land use indicates that there is an exposure potential, then the action alternative will be clean closure. If COCs exceed action levels and future land use limits exposure, and there is limited risk to human health and the environment then closure in place will be recommended. If COCs are not present above action levels, then no further action will be required.

6.0 SPECIFY LIMITS ON THE DECISION ERRORS

6.1 Sources of Potential Decision Error

Measurement error is influenced by imperfections in the measurement and analysis system. Random and systematic measurement errors are introduced in the measurement process during physical sample collection, sample handling , sample preparation, sample analysis, and data reduction.

Errors introduced during sample collection and handling are minimized by developing a sampling and analysis plan. Bechtel Nevada Environmental Restoration sampling plans are compliant with approved operational instructions for sample collection, field documentation, and equipment decontamination. After samples are collected, the sample is identified with a unique number. A custody seal is placed on the container. The "Services Request & Chain of Custody Record" form is filled out and maintained.

Sample preparation and analysis errors are minimized by using an EPA-approved analytical method. Additionally quality control samples are added to maintain the following:

- Accuracy - Closeness of a measurement or the mean of a set of results to the true value. Accuracy is a measure of the bias of the measurement system. Indicators for measurement are based on the percent recoveries associated with the laboratory analytical control spikes, surrogate spikes, or matrix spikes.

- Comparability - A qualitative judgement which expresses the confidence with which one set can be compared to another. Items used to determine comparability include the analytical method and reporting units.

- Completeness - Indicators for this measurement are the amount of valid data obtained from a measurement system compared to the amount that was expected and needed to be obtained to meet the project data goals.

- Precision - A measurement which represents the repeatability of the analytical system. Indicators for measurement are based on the relative percent difference (RPD) between field duplicates, laboratory splits, or laboratory replicate analysis. It is usually expressed as the RPD or standard deviation.

- Representativeness - A qualitative judgement which refers to a sample or group of samples that reflect the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

6.2 Limits on Decision Errors

Both previous and future sampling at CAU 358 have and will use a biased sampling approach. The biased sampling approach does not allow for the assessment of whether or not specific decision error rate limits have been attained. Therefore, for biased sampling a decision error rate cannot be established. Because an error rate cannot be established, the discussion of Type I (false rejection of the null hypothesis) and Type II (false acceptance of the null hypothesis) is not very meaningful. A valid null hypothesis for each CAS in CAU 358 would be that COCs pose an unacceptable risk to human health and the environment.

7.0 OPTIMIZE THE DESIGN - OUTLINE A SAMPLING DESIGN, SPECIFYING THE OPERATIONAL DETAILS OF THE SAMPLING PLAN WHICH FALLS WITHIN THE PROJECT'S CONSTRAINTS

7.1 Develop general sampling and analysis design alternatives.

Sampling will be conducted after clean up of appropriate sites are completed as specified in Section 4.3.

7.2 Select the most resource-effective design that satisfies all of the DQOs.

For those sites requiring clean closure by excavation and disposal, the impacted soil will be excavated. Verification samples will be collected to confirm that all soil impacted with COCs above action levels has been removed rather than characterize the extent of impacted soil in advance.

7.3 Document the operational details and theoretical assumptions of the selected design in the sampling and analysis plan.

Detailed documentation of sampling and analysis will be discussed in the SAFER Plan.

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APPENDIX B

USE RESTRICTION DOCUMENTATION

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CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 19-09-05 Mud Pit

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,124,578.64 m N	560,665.54 m E
NE corner:	4,124,584.61 m N	560,702.26 m E
SE corner:	4,124,562.86 m N	560,712.12 m E
SW corner:	4,124,548.72 m N	560,681.24 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

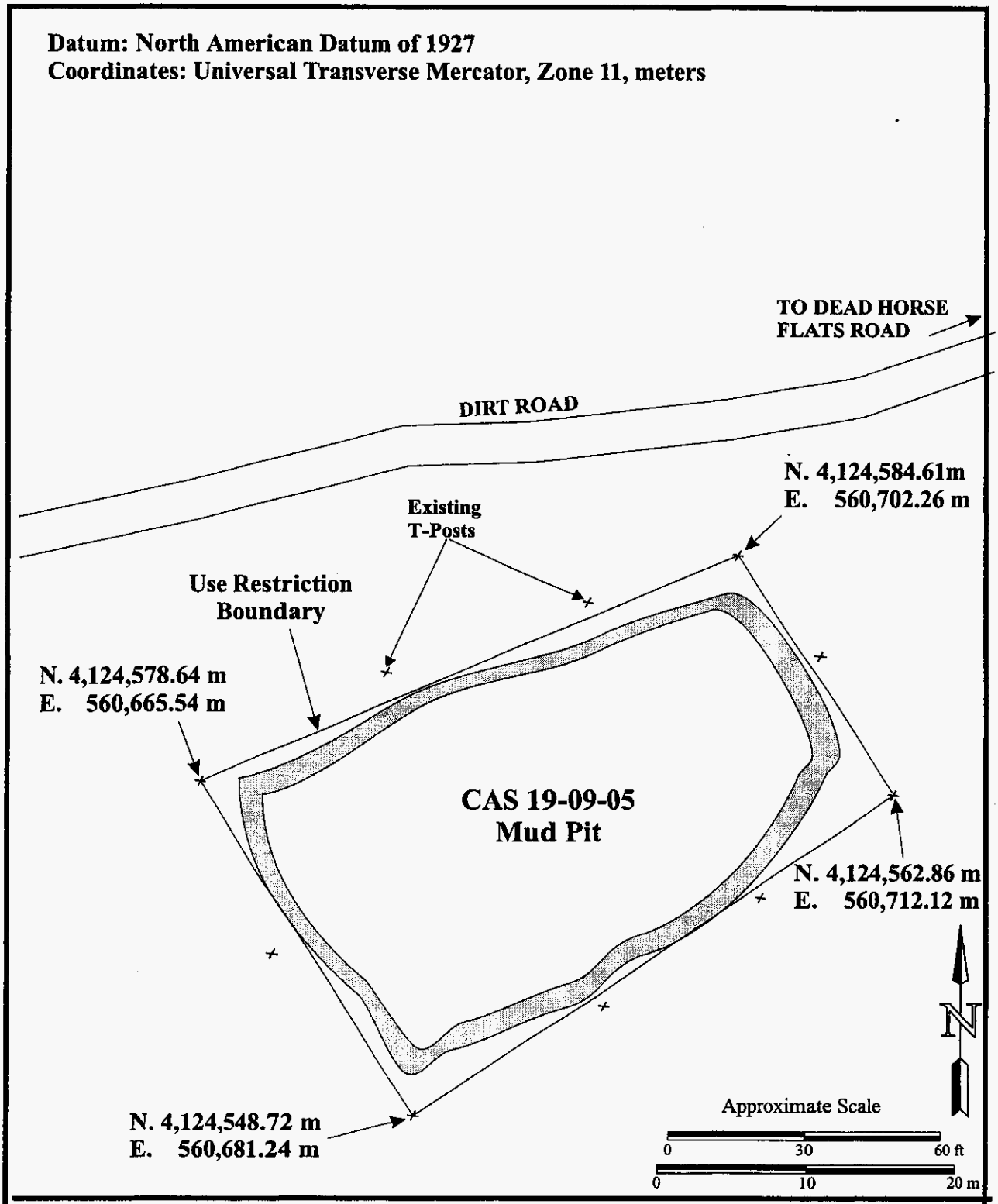
Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site.

Submitted By: Sabrina Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 19-09-05: Mud Pit

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-23-02 Postshot Cellar

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,123,492.04 m N	546,370.90 m E
NE corner:	4,123,491.52 m N	546,376.18 m E
SE corner:	4,123,485.76 m N	546,375.65 m E
SW corner:	4,123,486.48 m N	546,370.49 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

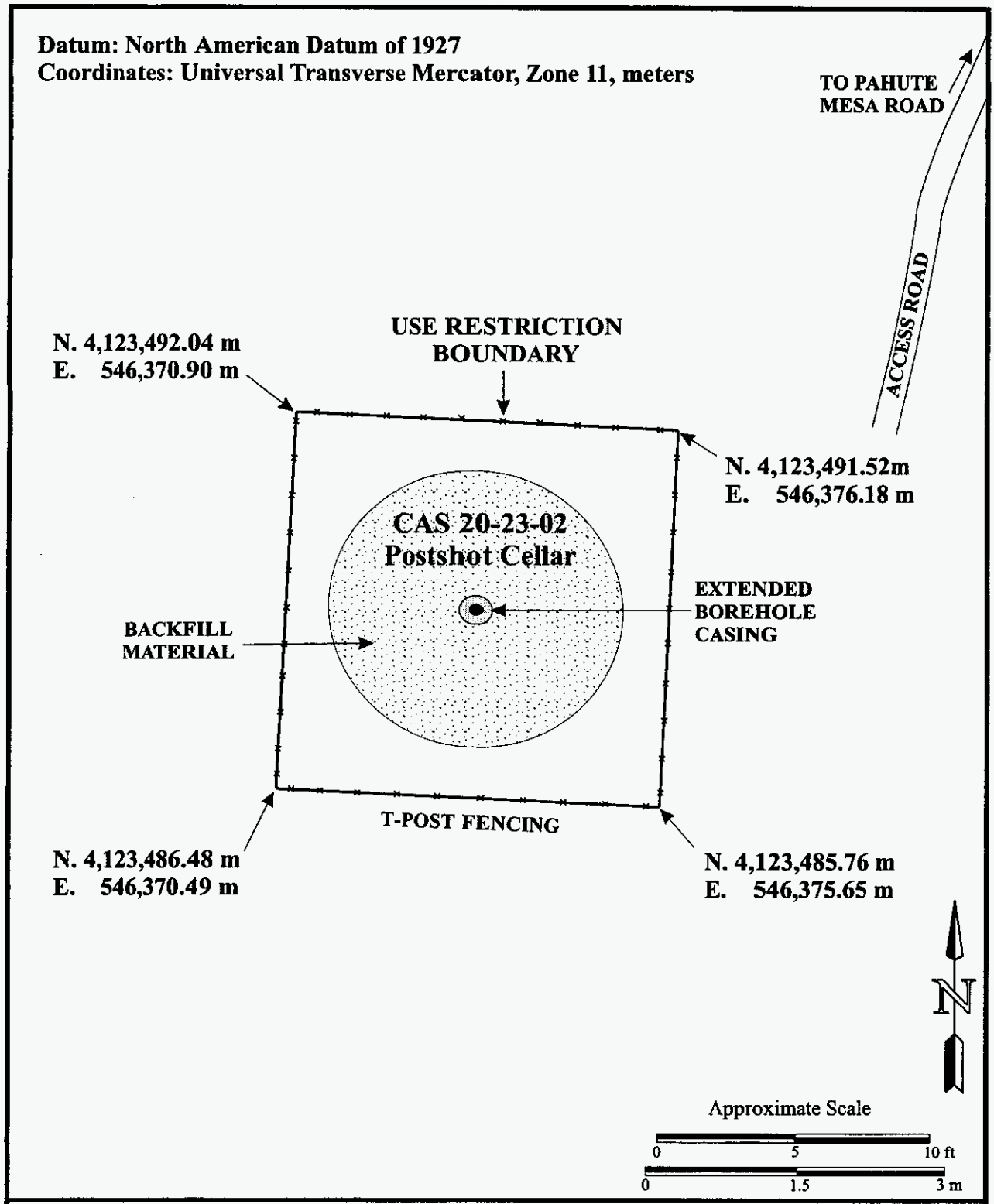
Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabrina Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-23-02: Postshot Cellar

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-23-03 Cellar

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,120,700.81 m N	552,389.06 m E
NE corner:	4,120,700.25 m N	552,394.39 m E
SE corner:	4,120,692.71 m N	552,394.46 m E
SW corner:	4,120,691.99 m N	552,389.24 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

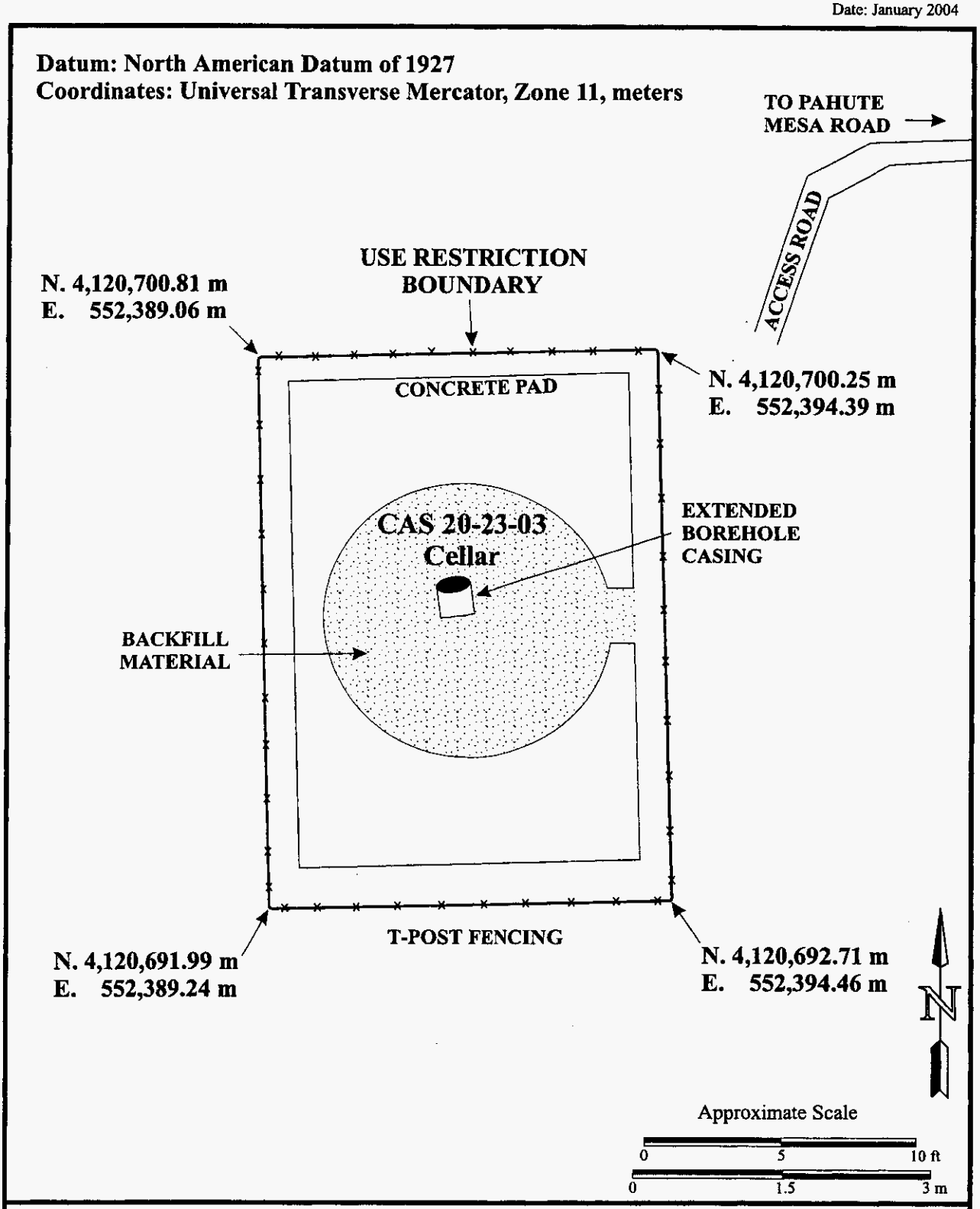
Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabine Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-23-03: Cellar

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-23-04 Postshot Cellar

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,124,699.71 m N	552,063.75 m E
NE corner:	4,124,697.02 m N	552,067.02 m E
SE corner:	4,124,693.28 m N	552,063.92 m E
SW corner:	4,124,695.97 m N	552,060.65 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

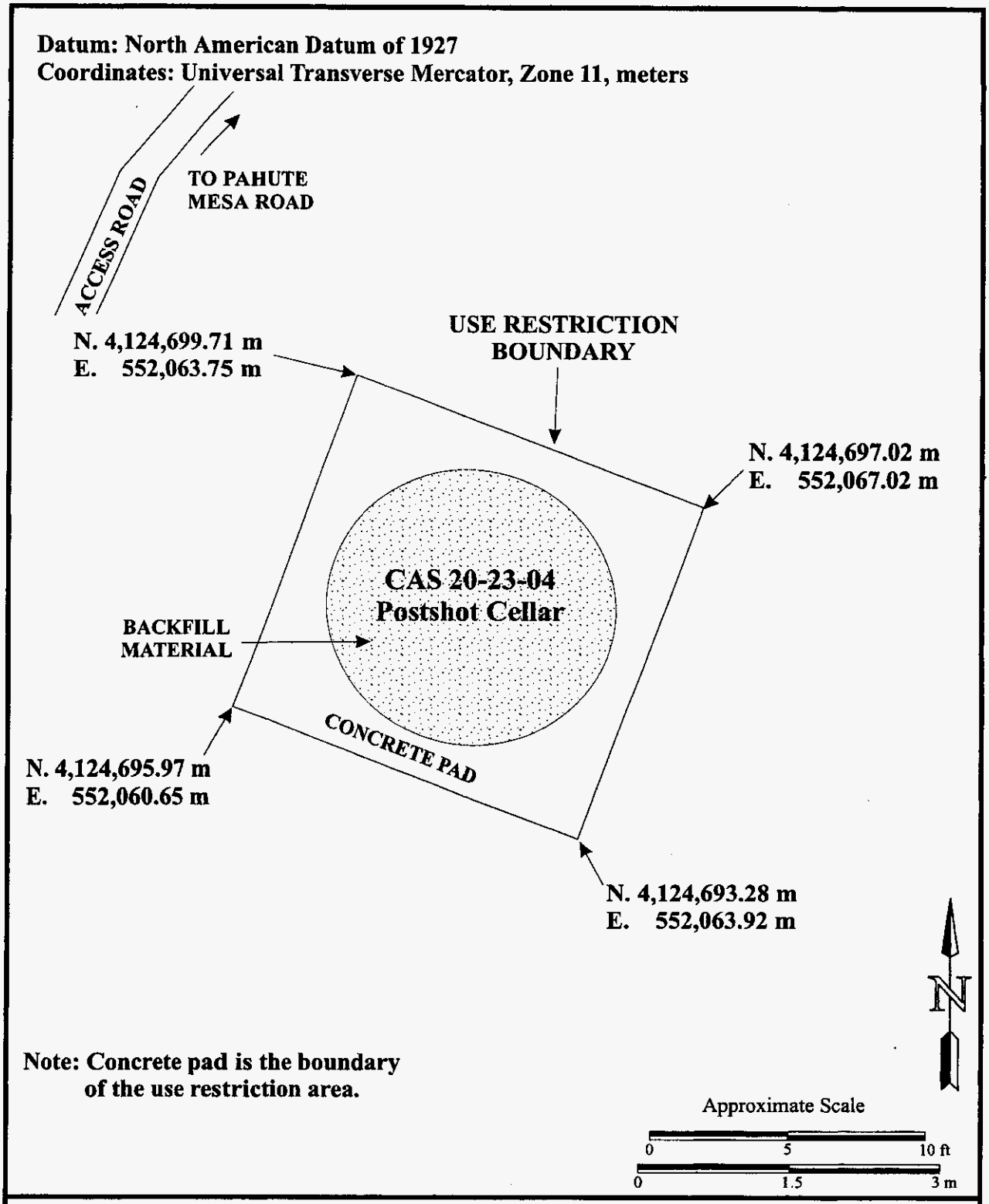
Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabine Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-23-04: Postshot Cellar

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-23-05 Postshot Cellar

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,125,287.22 m N	552,034.71 m E
NE corner:	4,125,284.82 m N	552,037.38 m E
SE corner:	4,125,281.17 m N	552,035.32 m E
SW corner:	4,125,283.93 m N	552,032.38 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

Use Restrictions

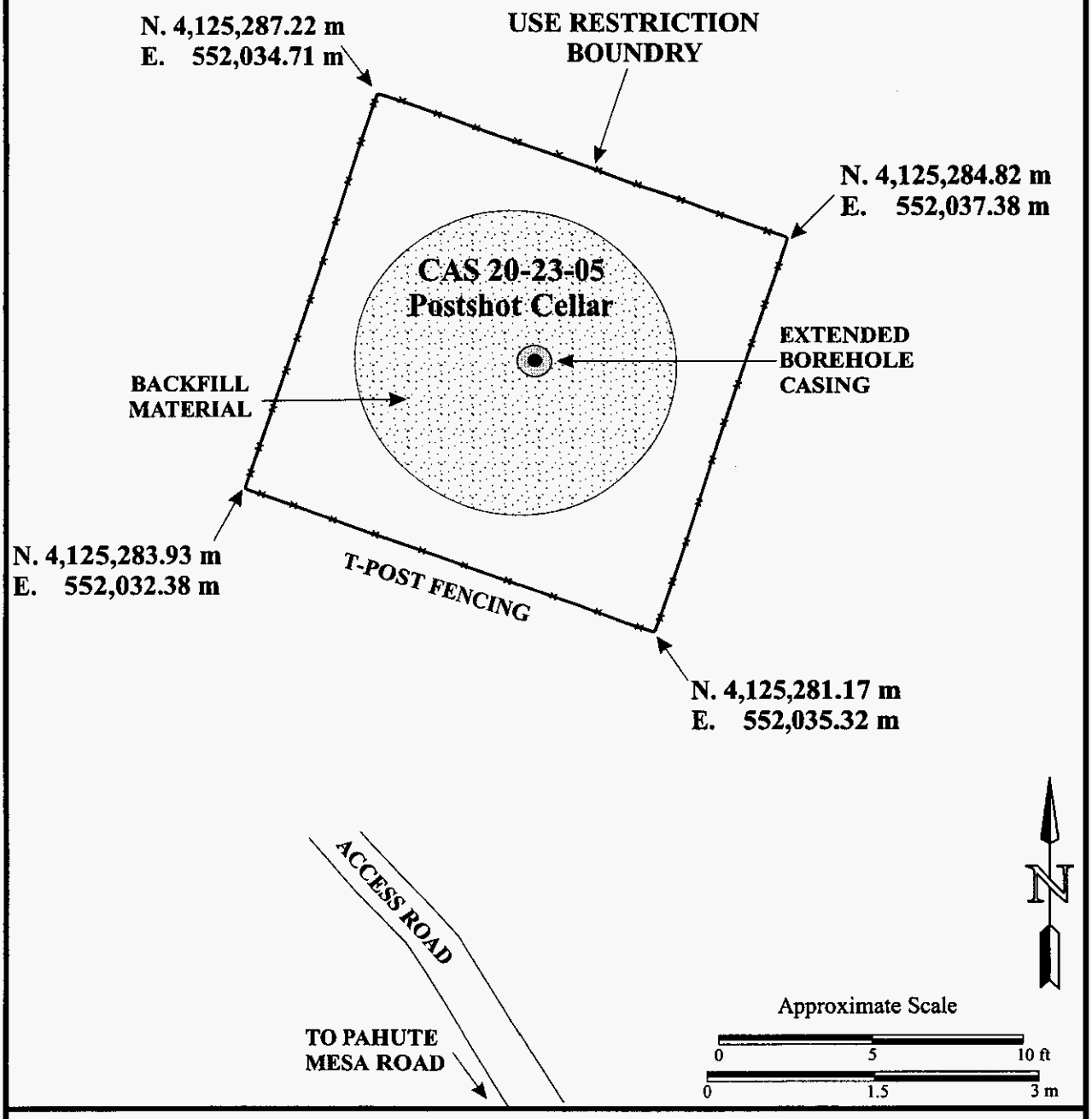
The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabine Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure

Datum: North American Datum of 1927
Coordinates: Universal Transverse Mercator, Zone 11, meters



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-23-05: Postshot Cellar

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-23-06 Cellar

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,122,384.82 m N	550,964.29 m E
NE corner:	4,122,386.00 m N	550,970.10 m E
SE corner:	4,122,381.96 m N	550,971.56 m E
SW corner:	4,122,380.65 m N	550,965.87 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

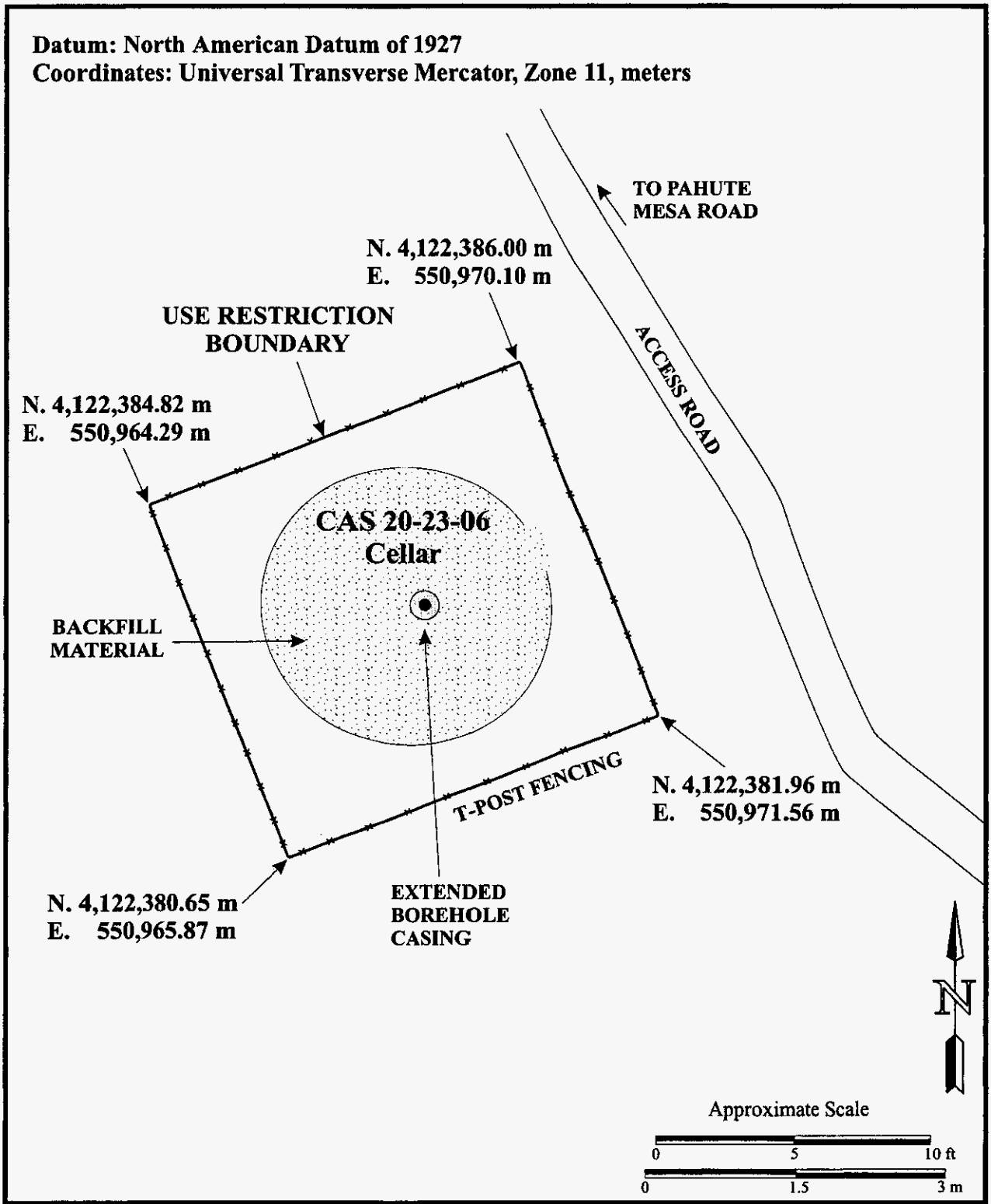
Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabine Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-23-06: Cellar

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-37-01 Cellar & Mud Pit

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

NW corner:	4,128,914.79 m N	547,176.59 m E
NE corner:	4,128,916.62 m N	547,180.57 m E
SE corner:	4,128,912.46 m N	547,182.68 m E
SW corner:	4,128,910.25 m N	547,178.69 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

Use Restrictions

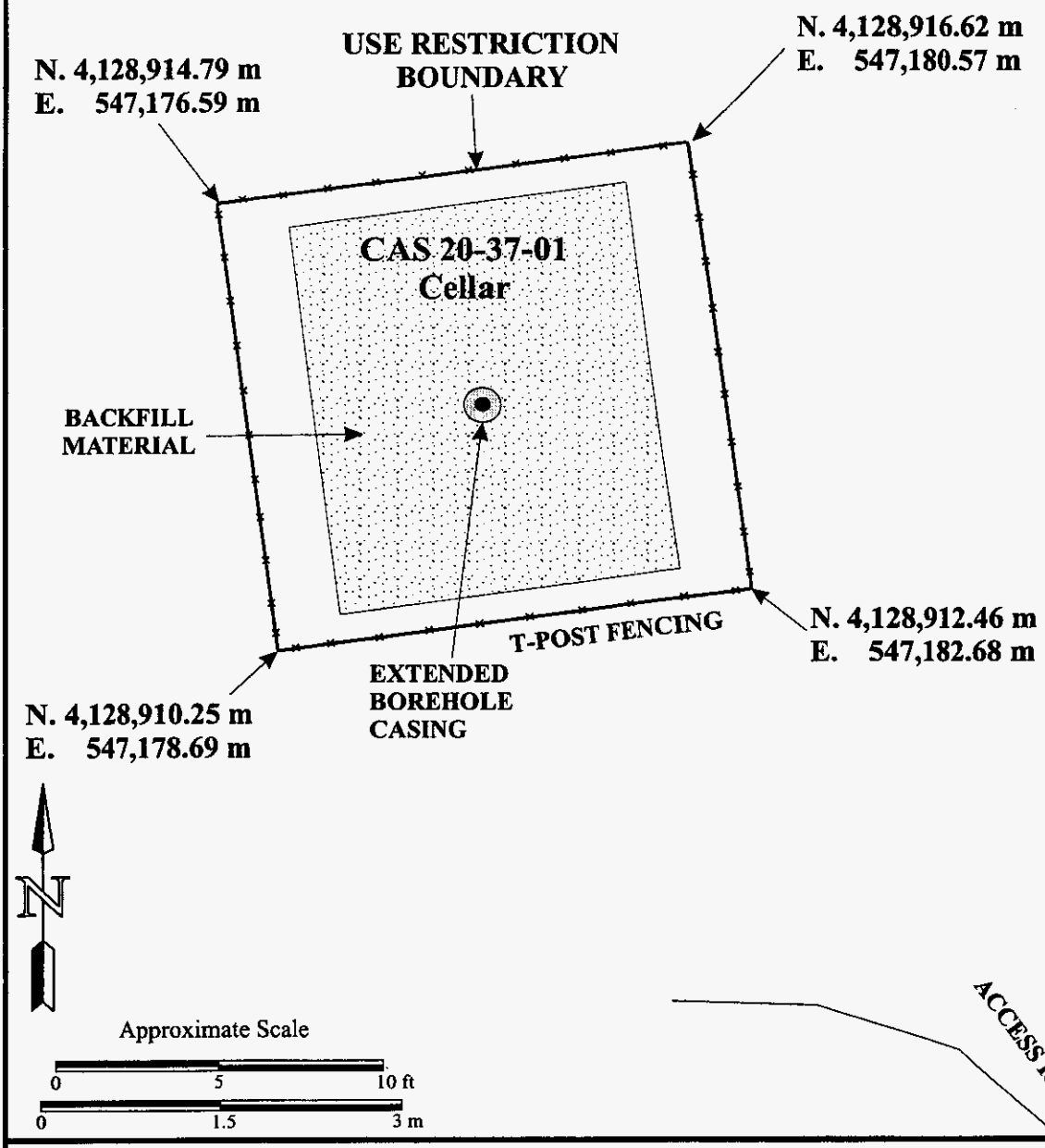
The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabine Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure

Datum: North American Datum of 1927
Coordinates: Universal Transverse Mercator, Zone 11, meters



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-37-01: Cellar & Mud Pit

CAU Use Restriction Information

CAU Number/Description: CAU 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada

Applicable CAS Numbers/Descriptions: CAS 20-37-05 Cellar

Contact (organization/project): NNSA/NSO Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27):

N corner:	4,122,204.11 m N	545,551.99 m E
E corner:	4,122,203.78 m N	545,557.60 m E
S corner:	4,122,199.48 m N	545,550.31 m E
W corner:	4,122,200.34 m N	545,546.22 m E

Survey Date: 06/26/2003 **Survey Method (GPS, etc.):** Transit Survey

Site Monitoring Requirements: None

Required Frequency (quarterly, annually?): N/A

If Monitoring Has Started, Indicate Last Completion Date: N/A

Use Restrictions

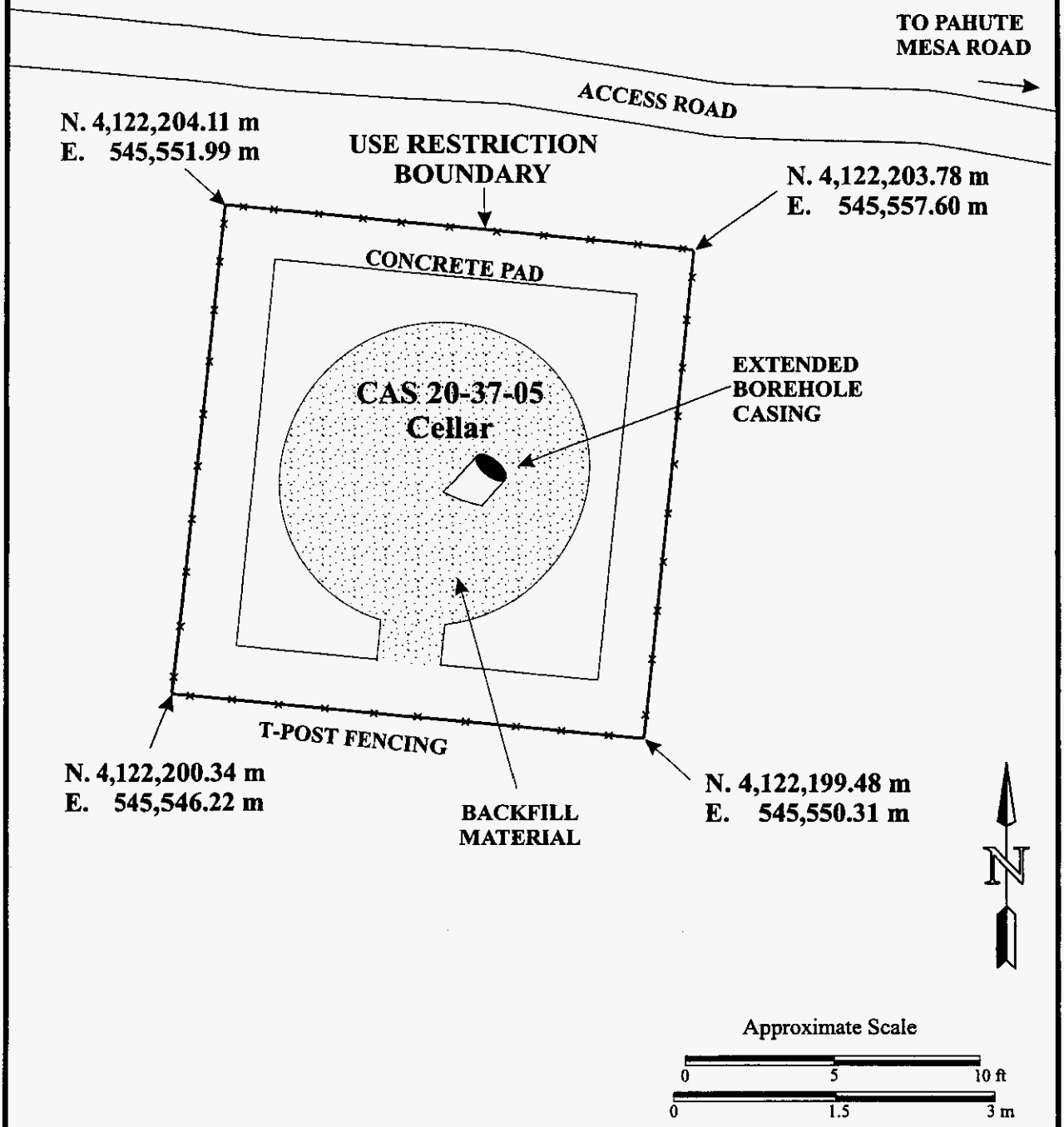
The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 358 Closure Report (Document number DOE/NV--944) for additional information on the condition of the site. The borehole may be used for future sampling without disturbing the use restriction on the backfilled cellar.

Submitted By: Sabine Curtis **Date:** 12/17/03

Attachments: Use Restriction Figure

Datum: North American Datum of 1927
Coordinates: Universal Transverse Mercator, Zone 11, meters



USE RESTRICTION INFORMATION
CAU 358: Areas 18, 19, 20 Cellars/Mud Pits
CAS 20-37-05: Cellar

APPENDIX C

SAMPLE ANALYTICAL RESULTS

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TABLE OF CONTENTS - SAMPLE ANALYTICAL RESULTS BY SAMPLE DELIVERY GROUP

Note: Analytical results are presented in this Appendix in the order indicated below.

CAS 02-99-01
SDG V2022: Composite soil samples of stockpiled soil ..... 029901A through 029901E
SDG V2025: Soil samples from bottom of excavation ..... 029901-0V through 029901-12V

CAS 03-22-33
SDG V2027: Soil samples of stockpiled debris 032233-1
Trip Blanks (VOC) ..... 358-TB1 and 358-TB2
SDG V2028: Soil samples of stockpiled debris 032233-1

CAS 03-99-04
SDG V2026: Soil samples of soil underneath spill ..... 039904-V0 through 039904-V15

CAS 18-09-01
SDG V2014: Samples from area of bucket (pipe dope) ..... 180901-1V and 180901-2V
Samples from area of broken batteries ..... 180901-0V, 3V, 4V, and 5V
SDG V2050: Soil sample from inside of drum (broken batteries) 180901-6V

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SAMPLE DELIVERY GROUP

V2022

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LIONVILLE LABORATORY INC.

25 July 2003

Mr. Theodore Redding
Bechtel Nevada Corporation
2621 Losee Road
Mail Stop NTS273
Las Vegas, NV 89030-4134

RE: Subcontract No. 30028, Task Order No. 1
Data Report for LVL Batch 0307L812
SDG#: V2022 Chain: CAU 358

Dear Mr. Redding:

Enclosed please find the data report for 5 soil samples received 16 July 2003 for analysis for metals on a 14 day turnaround time. The invoice is enclosed. An EDD is not required.

Please do not hesitate to contact me at (610) 280-3029 with any questions or at any time we may be of service.

Very truly yours,

Lionville Laboratory Incorporated

Judith L. Stone
Senior Project Manager

Enclosure:

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502

Charge Number: 54403LZ50

Project Manager: Jeffrey Smith

Phone: 702-295-7778 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon

Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306

Turnaround: ☐ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☒ Rush Preliminary by: _____ (IH)
☐ 1 ☐ 2 ☐ 7 ☒ 14 (non-Rad Env)
☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358

The samples submitted contain (check):
☐ Hazardous *(list)* - _____
☐ Radioactive *(list)* - _____
☒ Unknown contamination.

If known, identify contaminants.

This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2022 (Non-Rad Env) _____ (Rad Env)

Samples submitted are associated with a signed Project SOW ☒ Yes ☐ No

Analyses entered here agree with the SOW ☒ Yes ☐ No ☐ N/A

If not, identify the variation: ~~LIONVILLE~~ Conc

Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 9.25	TCLP-Lead (6010)
029901A	7/14/03	13:41	Soil	1	250mL						X
029901B	7/14/03	14:21	↓	1	↓						X
029901C	7/14/03	14:24		1							X
029901D	7/14/03	14:31		1							X
029901E	7/14/03	14:44	↓	1	↓						X
Last Item											

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	7/15/03 7:27	CD CASTANEDA	CD Castaneda	7/15/03 @ 0727
CD Castaneda	CD CASTANEDA	7/15/03 @ 1300	Fed Ex	790839504226	7/15/03 @ 1300
FedEx		7/16/03 0930	JPerry	JPerry	7/16/03 0930

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Case Narrative

LIONVILLE LABORATORY INC.

Analytical Report

Client : BECHTEL NEVADA V2022
LVL# : 0307L812

W.O.# : 60052-001-001-0001-00
Date Received : 07-16-03

SW846 METALS

1. This narrative covers the analyses of 5 TCLP leachate samples.

2. The samples were prepared and analyzed in accordance with SW-846 protocol and reported with a CLP deliverable.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.

6. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

7. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within method criteria.

8. All preparation/method blanks were within method criteria. Refer to form 3.

9. All ICP Interference Check Standards were within control limits. Refer to form 4.

10. The laboratory control sample (LCS) was within the 80-120% control limits. Refer to form 7.

11. The serial dilution percent difference was within SW-846 control limits. Refer to form 9.

12. The TCLP extract from sample 029901A was selected for the matrix spike (MS) for this analytical batch. The MS recovery in the TCLP extract was above 50% per method criteria.

13. All sample IDs were changed to accommodate the EPA naming convention which allows a maximum of 6 characters on all CLP Forms. Refer to the comments section of form 1 for the original ID.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

14. Recoveries on the Laboratory Summary Report and CLP forms will vary depending on the number of significant figures used in the recovery calculation.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

07-25-03
Date

gmb\m07-812

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

Inorganic Analysis Data Package

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/24/03

CLIENT: BECHTEL NEVADA V2022 LVL LOT #: 0307L812

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	029901A	Lead, TCLP Leachate	38.5	u	UG/L	38.5	1.0
-007	029901B	Lead, TCLP Leachate	38.5	u	UG/L	38.5	1.0
-008	029901C	Lead, TCLP Leachate	38.5	u	UG/L	38.5	1.0
-009	029901D	Lead, TCLP Leachate	38.5	u	UG/L	38.5	1.0
-010	029901E	Lead, TCLP Leachate	38.5	u	UG/L	38.5	1.0

U.S. EPA

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

29901A

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2022 SAS No.: _____ SDG No.: 29901A
Matrix (soil/water): WATER Lab Sample ID: 0307L812-006
Level (low/med): LOW__ Date Received: 07/16/03
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
029901A
TCLP_OF_001

FORM I - IN

U.S. EPA

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

29901B

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2022 SAS No.: _____ SDG No.: 29901A
Matrix (soil/water): WATER Lab Sample ID: 0307L812-007
Level (low/med): LOW__ Date Received: 07/16/03
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
029901B
TCLP_OF_002

FORM I - IN

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

29901C

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____ SDG No.: 29901A

Lab Code: LVLI__ Case No.: V2022 SAS No.: _____ Lab Sample ID: 0307L812-008

Matrix (soil/water): WATER Date Received: 07/16/03

Level (low/med): LOW__

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

029901C

TCLP_OF_003

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

29901D

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____

Lab Code: LVLI__ Case No.: V2022 SAS No.: _____ SDG No.: 29901A

Matrix (soil/water): WATER Lab Sample ID: 0307L812-009

Level (low/med): LOW__ Date Received: 07/16/03

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

029901D

TCLP_OF_004

FORM I - IN

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

29901E

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____ SDG No.: 29901A

Lab Code: LVLI__ Case No.: V2022 SAS No.: _____ Lab Sample ID: 0307L812-010

Matrix (soil/water): WATER Date Received: 07/16/03

Level (low/med): LOW__

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

029901E

TCLP_OF_005

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SAMPLE DELIVERY GROUP

V2025

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0307L854

Bechtel Nevada

ANALYTICAL LABORATORY
SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 2

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502
Charge Number: 5H03LZ50
Project Manager: Jeffrey Smith
Phone: 702-295-7781 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon
Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306
Turnaround: ☒ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☐ Rush Preliminary by: _____ (IH)
☐ 1 ☐ 2 ☐ 7 ☐ 14 (non-Rad Env)
☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358
The samples submitted contain (check);
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☑ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2085 (Non-Rad Env) _____ (Rad Env)
Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No
Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A
If not, identify the variation: _____
Subcontract Lab(s) used for this work: LIONVILLE

	ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 10.52	TPH full scan 8015
1	029901-0V	7/15/03	9:30	Soil	1	250mL					X	X
2	029901-1V		9:31		1						X	X
3	029901-2V		9:39		1						X	X
4	029901-3V		9:40		1						X	X
5	029901-4V		9:44		1						X	X
6	029901-5V		9:49		1						X	X
7	029901-6V		9:53		1						X	X
8	029901-7V		10:00		1						X	X
9	029901-8V		10:04		1						X	X
10	029901-9V	↓	10:11	↓	1	↓					X	X

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	7/16/03 7:18	Jerry J. Dugas	JERRY J. DUGAS	7/16/03 0818
for Jerry Dugas	C Castaneda	7/17/03@1300	Fed Ex	791633863410	7/17/03@1300
Fed Ex	Fed Ex	7/18/03 @ 0910			

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Bechtel Nevada

ANALYTICAL LABORATORY
SERVICES REQUEST & CHAIN OF CUSTODY RECORD

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502
Charge Number: 5H03LZ50
Project Manager: Jeffrey Smith
Phone: 702-295-7775 | Fax: 702-295-7761 | M/S: NE306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon
Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306
Turnaround: ☒ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☐ Rush Preliminary by: _____ (IH)
☐1 ☐2 ☐7 ☐14 (non-Rad Env)
☐1 ☐7 ☐14 ☐28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358
The samples submitted contain (check);
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☑ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2025 (Non-Rad Env) _____ (Rad Env)
Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No
Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A
If not, identify the variation: _____
Subcontract Lab(s) used for this work: LIONVILLE

	ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: TPH full scan 8015	10.52
11	029901-10V	7/15/03	10:17	Soil	1	250mL					X	
12	029901-11V	↓	10:22	↓	1	↓					X	
13	029901-12V	↓	10:29	↓	1	↓					X	
	Next Item											

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
for MARCUS DIXON	Jerry J. Dugas	7/16/03 818	Jerry J. Dugas	JERRY J. DUGAS	7/16/03 0818
for Jerry Dugas	CJ Castaneda	7/17/03 @ 1300	Fed Ex *	791633863410	7/17/03 @ 1300
Fed Ex		7/18/03 0910	Victor Hernandez	VICTOR HERNANDEZ	7/18/03 0910

* See page 2 of 2

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2025
LVL #: 0307L854

W.O. #: 60052-001-001-0001-00
Date Received: 07-18-2003

DIESEL RANGE ORGANICS

Thirteen (13) soil samples were collected on 07-15-2003.

The samples and their associated QC samples were extracted on 07-21-2003 and analyzed according to Lionville Laboratory OPs on 07-25,26,30-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B for Diesel Range Petroleum Hydrocarbons.

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.

2. The required holding time for extraction and analysis has been met.

3. The method blank was below the reporting limits for all target compounds.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recovery was within acceptance criteria.

6. The matrix spike recoveries were within acceptance criteria.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/4/03
Date

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208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = *Not Applicable.*

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

SAMPLE DATA FOR EACH SAMPLE

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-0V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-001

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/25/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-1V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-002

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/25/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.2	U
00-00-0000	Motor Oil	12.2	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-2V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-003

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.2	U
00-00-0000	Motor Oil	20	

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-3V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-004

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/25/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.3	U
00-00-0000	Motor Oil	12.3	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-4V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-005

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/25/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.2	U
00-00-0000	Motor Oil	12.2	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-5V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-006

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-6V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-007

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.3	U
00-00-0000	Motor Oil	12.3	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-7V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-008

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 4

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.5	U
00-00-0000	Motor Oil	12.5	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-8V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-009

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-9V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-010

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 6

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.8	U
00-00-0000	Motor Oil	12.8	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-10V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL Lab Sample ID: 0307L854-011

Sample wt/vol: 25.0 (g/mL) G Lab File ID: BLKLACHJ

Level: (low/med) LOW Date Received: 07/18/03

% Moisture: not dec. 3 Date Analyzed: 07/26/03

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-11V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-012

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

029901-12V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-013

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.3	U
00-00-0000	Motor Oil	12.3	U

12/88 Rev.

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2025
LVL #: 0307L854

W.O. #: 60052-001-001-0001-00
Date Received: 07-18-2003

GRO

Thirteen (13) soil samples were collected on 07-15-2003.

The samples and their associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 method 8015 for Gasoline range organics (GRO) on 07-23,26,28-2003.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.

2. Samples were analyzed within required holding time.

3. The method blanks were below the reporting limit for the target compound.

4. All surrogate recoveries were within acceptance criteria.

5. All blank spike recoveries were within acceptance criteria.

6. All matrix spike recoveries were within acceptance criteria.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Jain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/6/03
Date

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208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

SAMPLE DATA FOR EACH SAMPLE

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-0V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-001

Sample wt/vol: 5.06 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/23/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-0VRE

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-001

Sample wt/vol: 4.86 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/28/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-1V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-002

Sample wt/vol: 5.02 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/23/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-2V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-003

Sample wt/vol: 4.96 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-3V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL Lab Sample ID: 0307L854-004

Sample wt/vol: 4.88 (g/mL) G Lab File ID: BLKLACHJ

Level: (low/med) LOW Date Received: 07/18/03

% Moisture: not dec. 2 Date Analyzed: 07/26/03

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-4V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-005

Sample wt/vol: 5.08 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 2

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-5V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-006

Sample wt/vol: 5.17 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-6V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-007

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-7V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-008

Sample wt/vol: 5.15 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 4

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-8V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-009

Sample wt/vol: 5.08 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/28/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-9V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-010

Sample wt/vol: 5.05 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 6

Date Analyzed: 07/28/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-10V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-011

Sample wt/vol: 5.21 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/28/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-11V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-012

Sample wt/vol: 4.83 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/28/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

029901-12V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2025

Matrix: SOIL

Lab Sample ID: 0307L854-013

Sample wt/vol: 4.99 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/18/03

% Moisture: not dec. 3

Date Analyzed: 07/28/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

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SAMPLE DELIVERY GROUP

V2027

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LIONVILLE LABORATORY INC.

11 August 2003

Mr. Theodore Redding
Bechtel Nevada Corporation
2621 Losee Road
Mail Stop NTS273
Las Vegas, NV 89030-4134

RE: Subcontract No. 30028, Task Order No. 1
Data Report for LVL Batch 0307L928
SDG#: V2027 Chain: CAU 358

Dear Mr. Redding:

Enclosed please find the data report for 1 soil sample and 2 waters received 24 July 2003 for analysis for TPH GRO/DRO/ORO, metals, SVOCs, VOCs, and PCBs on a 14 day turnaround time. The invoice is enclosed. An EDD is not required. These data were faxed 7 August.

Please do not hesitate to contact me at (610) 280-3029 with any questions or at any time we may be of service.

Very truly yours,

Lionville Laboratory Incorporated

Judith L. Stone
Senior Project Manager

Enclosure:

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Nevada

ANALYTICAL LABORATORY
SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT/CLIENT INFORMATION
Project: CAU 358 | BN Org #: B502
Charge Number: 51103 L2 50
Project Manager: Jeffrey Smith
Phone: 702-295-7775 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION
Send Report to: Marcus Dixon
Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306
Turnaround: ☐ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env.
☒ Rush Preliminary by: _____ (IH)
☐1 ☐2 ☐7 ☒14 (non-Rad Env)
☐1 ☐7 ☐14 ☐28 (Radiological Env)

SAMPLE INFORMATION
Sampling Site: CAU 358
The samples submitted contain (check):
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☑ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION
SDG: _____ (IH) V2027 (Non-Rad Env) _____ (Rad Env)
Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No
Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A
If not, identify the variation: _____
Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 10.52 TPH full scan 8015	9.22 RCRA Metals 6010, 7470	7.2 SVOCs 8270	8.1 PCBs 8082	6.10 VOCs 8260	1.28 VOCs		
358-TB1	7/22/03	8:10	Water	1	40mL vial				H_2SO_4						X		
358-TB2	7/22/03	8:13	Water	1	40mL vial				H_2SO_4						X		
032233-1	7/22/03	10:30	Soil	6	per Method					X	X	X	X	X			
LAST ITEM																	

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Kevin B. Campbell	Kevin B Campbell	7/23/03 9:25	JERRY DUGAS	Jerry J. Dugas	7/23/03 0929
for J. DUGAS	CJ Contractors	7/23/03@1300	Fed Ex #	790356358664	7/23/03@1300
FedEX		7/24/03 0915	JPerry	JPerry	7/24/03 0915

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2027
LVL #: 0307L928

W.O. #: 60052-001-001-0001-00
Date Received: 07-24-2003

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 07-22-2003.

The sample and its associated QC samples were extracted on 07-29-2003 and analyzed according to Lionville Laboratory OPs on 07-30-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B for Diesel Range Petroleum Hydrocarbons.

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.

2. The required holding time for extraction and analysis has been met.

3. The method blank was below the reporting limits for all target compounds.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recoveries were within acceptance criteria.

6. All initial calibrations associated with this data set were within acceptance criteria.

7. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

09-09-03
Date

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GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

SAMPLE DATA FOR EACH SAMPLE

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

032233-1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2027

Matrix: SOIL

Lab Sample ID: 0307L928-003

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/24/03

% Moisture: not dec. 4

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.6	U
00-00-0000	Motor Oil	53	

12/88 Rev.

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2027
LVL #: 0307L928

W.O. #: 60052-001-001-0001-00
Date Received: 07-24-2003

GRO

One (1) soil sample was collected on 07-22-2003.

The sample and its associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 method 8015 for Gasoline range organics (GRO) on 08-04-2003.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.

2. The sample was analyzed within required holding time.

3. The method blank was below the reporting limit for the target compounds.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recoveries were within acceptance criteria.

6. All initial calibrations associated with this data set were within acceptance criteria.

7. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

08-08-03
Date

som\Rrgroup\data\GRO\0307-928.doc

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GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

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SAMPLE DATA FOR EACH SAMPLE

GC VOLATILES SHEET

CLIENT SAMPLE NO.

032233-1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2027

Matrix: SOIL

Lab Sample ID: 0307L928-003

Sample wt/vol: 5.17 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/24/03

% Moisture: not dec. 4

Date Analyzed: 08/04/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

Case Narrative

LIONVILLE LABORATORY INC.

Client: BECHTEL-NEVADA V2027
LVL #: 0307L928

W.O. #: 60052-001-001-0001-00
Date Received: 07-24-2003

SEMIVOLATILE

One (1) soil sample was collected on 07-22-2003.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on methods 3550 on 07-30-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 08-01-2003.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.

2. The sample was extracted and analyzed within required holding time.

3. Non-target compounds were not reported as per client request.

4. All surrogate recoveries were within EPA QC limits.

5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. Internal standard area and retention time criteria were met.

8. Manual integrations are performed according to OP L-QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

J. Michael Taylor
President
Lionville Laboratory Incorporated

08-07-03
Date

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GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

Sample Data for each Sample

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

032233-1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2027

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L928-003

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: C080114

Level: (low/med) LOW

Date Received: 07/24/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 07/30/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/01/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	870	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	870	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	870	U
83-32-9	Acenaphthene	350	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

032233-1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2027

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L928-003

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: C080114

Level: (low/med) LOW

Date Received: 07/24/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 07/30/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/01/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	870	U
100-02-7	4-Nitrophenol	870	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	870	U
534-52-1	4,6-Dinitro-2-methylphenol	870	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	350	J
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	25	J
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	36	J
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

Case Narrative

LIONVILLE LABORATORY INC.

Analytical Report

Client : BECHTEL NEVADA V2027
LVL# : 0307L928

W.O.# : 60052-001-001-0001-00
Date Received : 07-24-03

SW846 METALS

1. This narrative covers the analysis of 1 soil sample.

2. The sample was prepared and analyzed in accordance with SW-846 protocol and reported with a CLP deliverable.

   The sample was reported with a six fold dilution for all ICP analytes due to the high concentration of Iron in the sample.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

6. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

7. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within method criteria.

8. All preparation/method blanks were within method criteria. Refer to form 3.

9. All ICP Interference Check Standards were within control limits. Refer to form 4.

10. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.

11. All serial dilution percent differences were within SW-846 control limits. Refer to form 9.

12. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. All matrix spike duplicate (MSD) recoveries were within the 75-125% control limits. Refer to form 5A.

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13. For analytes where the MS is out of control, a post-digestion MS (PDS) is performed. A PDS was prepared at meaningful concentration levels. Refer to form 5B.

14. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to form 6.

15. All sample IDs were changed to accommodate the EPA naming convention which allows a maximum of 6 characters on all CLP Forms. Refer to the comments section of form 1 for the original ID.

16. Recoveries on the Laboratory Summary Report and CLP forms will vary depending on the number of significant figures used in the recovery calculation.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

08-11-03
Date

gmb\m07-928

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

Inorganic Analysis Data Package

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/07/03

CLIENT: BECHTEL NEVADA V2027 LVL LOT #: 0307L928

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	032233-1	Silver, Total	0.72 u	MG/KG	0.72	6.0
		Arsenic, Total	11.4	MG/KG	2.0	6.0
		Barium, Total	125	MG/KG	0.12	6.0
		Cadmium, Total	0.24 u	MG/KG	0.24	6.0
		Chromium, Total	10.9	MG/KG	0.60	6.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	47.6	MG/KG	1.4	6.0
		Selenium, Total	2.5 u	MG/KG	2.5	6.0

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

032233

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2027 SAS No.: _____ SDG No.: 032233
Matrix (soil/water): SOIL_ Lab Sample ID: 0307L928-003
Level (low/med): LOW__ Date Received: 07/24/03
% Solids: _95.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	11.4			P
7440-39-3	Barium	125		*	P
7440-43-9	Cadmium	0.24	U	N	P
7440-47-3	Chromium	10.9			P
7439-92-1	Lead	47.6			P
7439-97-6	Mercury	0.02	U	N	AV
7782-49-2	Selenium	2.5	U		P
7440-22-4	Silver	0.72	U		P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
032233-1

FORM I - IN

Case Narrative

LIONVILLE LABORATORY INC.

Client: BECHTEL-NEVADA V2027
LVL #: 0307L928

W.O. #: 60052-001-001-0001-00
Date Received: 07-24-2003

GC/MS VOLATILE

One (1) soil and two (2) water samples were collected on 07-22-2003.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for TCL Volatile target compounds on 08-01,02-2003.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. The required holding time for analysis was met.
3. Non-target compounds were not reported as per client request.
4. One (1) of twenty-seven (27) surrogate recoveries was outside EPA QC limits. The analysis of associated matrix spike sample fulfills the reanalysis requirement of sample 032233-1 MSD.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than 2x the CRQL.
8. Internal standard area criteria were not met for sample 032233-1. The analysis of associated matrix spike samples fulfills the reanalysis requirement.
9. The initial analysis of sample 358-TB1 was inadvertently performed outside the tune time; consequently, sample was reanalyzed. However, the reanalysis was performed using the same vial with 5mL of headspace because sample was used for the initial analysis. The similar results were obtained and the reanalysis has been reported as the primary analysis. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
10. Manual integrations are performed according to OP L-QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

Paul a

08-09-03

J. Michael Taylor
President
Lionville Laboratory Incorporated

Date

som\group\data\bna\bectel-nevada\0308-928.doc

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF BNA DATA

DATA QUALIFIERS

U	=	Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
J	=	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
B	=	This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
E	=	Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
D	=	Identifies all compounds identified in an analysis at a secondary dilution factor.
I	=	Interference.
NQ	=	Result qualitatively confirmed but not able to quantify.
A	=	Indicates that a TIC is a suspected aldol-condensation product.
N	=	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
X	=	This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
Y	=	Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

Sample Data for each Sample

1A

VOLATILE ORGANICS ANALYSIS SHEET

EPA SAMPLE NO.

358-TB1

Lab Name: Lionville Labs, Inc. Contract: 60052001001

Lab Code: Lionvi Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 0307L928-001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q080207

Level: (low/med) LOW Date Received: 07/24/03

% Moisture: not dec. _____ Date Analyzed: 08/02/03

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	JB
67-64-1	Acetone	48	
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	16	
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1A

VOLATILE ORGANICS ANALYSIS SHEET

EPA SAMPLE NO.

358-TB2

Lab Name: Lionville Labs, Inc. Contract: 60052001001

Lab Code: Lionvi Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 0307L928-002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: q080208

Level: (low/med) LOW Date Received: 07/24/03

% Moisture: not dec. _____ Date Analyzed: 08/02/03

Column: (pack/cap) CAP Dilution Factor: 1.00

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

CAS NO.	COMPOUND		
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	JB
67-64-1	Acetone	48	
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	17	
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS SHEET

EPA SAMPLE NO.

032233-1

Lab Name: Lionville Labs, Inc. Contract: 60052001001

Lab Code: Lionvi Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) SOIL Lab Sample ID: 0307L928-003

Sample wt/vol: 4.80 (g/mL) G Lab File ID: g080119

Level: (low/med) LOW Date Received: 07/24/03

% Moisture: not dec. 4 Date Analyzed: 08/01/03

Column: (pack/cap) CAP Dilution Factor: 1.04

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NO.	COMPOUND		
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	12	B
67-64-1	Acetone	3	J
75-15-0	Carbon Disulfide	6	U
75-35-4	1,1-Dichloroethene	6	U
75-34-3	1,1-Dichloroethane	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
67-66-3	Chloroform	6	U
107-06-2	1,2-Dichloroethane	6	U
78-93-3	2-Butanone	11	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
75-27-4	Bromodichloromethane	6	U
78-87-5	1,2-Dichloropropane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
79-01-6	Trichloroethene	6	U
124-48-1	Dibromochloromethane	6	U
79-00-5	1,1,2-Trichloroethane	6	U
71-43-2	Benzene	6	U
10061-02-6	Trans-1,3-Dichloropropene	6	U
75-25-2	Bromoform	6	U
108-10-1	4-Methyl-2-pentanone	11	U
591-78-6	2-Hexanone	11	U
127-18-4	Tetrachloroethene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-88-3	Toluene	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
100-42-5	Styrene	6	U
1330-20-7	Xylene (total)	2	J

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2027
LVL #: 0307L928

W.O. #: 60052-001-001-0001-00
Date Received: 07-24-2003

PCB

One (1) soil sample was collected on 07-22-2003.

The sample and its associated QC samples were extracted on 07-25-2003 and analyzed according to Lionville Laboratory OPs on 07-28-2003 and 08-04-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LVLI's sample acceptance policy.

2. The required holding time for extraction and analysis has been met.

3. The sample and its associated QC samples received a Sulfuric Acid cleanup.

4. The method blank was below the reporting limits for all target compounds.

5. All obtainable surrogate recoveries were within acceptance criteria. The surrogate recoveries of the sample were unobtainable due to the dilution required for the analysis.

6. All blank spike recoveries were within acceptance criteria.

7. Matrix spike recoveries were unobtainable due to the dilution required for the analysis.

8. The sample required a 10-fold dilution due to high concentration of non-target compounds. The reporting limits have been adjusted to reflect the necessary dilution.

9. All initial calibrations associated with this data set were within acceptance criteria.

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

09-09-03
Date

som\r:\group\data\pest\bechtel\0307-928.pcb

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P	=	This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form 1 and flagged with a "P".
D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

R:/SHARE/HPLC/PESTICIDE/PCBGLOS

SAMPLE DATA FOR EACH SAMPLE

1D

PESTICIDE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

032233-1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2027

Matrix: SOIL

Lab Sample ID: 0307L928-003

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: BLK08330.01

Level: (low/med) LOW

Date Received: 07/24/03

% Moisture: not dec. 100 dec.

Date Extracted: 07/25/03

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 08/04/03

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
12674-11-2	Aroclor-1016	330	U
11104-28-2	Aroclor-1221	330	U
11141-16-5	Aroclor-1232	330	U
53469-21-9	Aroclor-1242	330	U
12672-29-6	Aroclor-1248	330	U
11097-69-1	Aroclor-1254	330	U
11096-82-5	Aroclor-1260	330	U

FORM 1 PEST 12/88 Rev.

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SAMPLE DELIVERY GROUP

V2028

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PARAGON ANALYTICS, INC.
225 Commerce Drive ◆ Fort Collins, CO 80524 ◆ (800) 443-1511 ◆ (970) 490-1511 ◆ FAX (970) 490-1522

July 30, 2003

Mr. Ted Redding
Bechtel Nevada
US DOE Zone 1, Bldg 652, Rm 2, M/S NTS273
Mercury, NV 89023

Re: Paragon Workorder: 03-07-148
Client Project Name: CAU 358
Client Project Number: V2028

Dear Mr. Redding:

One soil sample was received from Bechtel Nevada on July 24, 2003. The sample was scheduled for Gamma Spectroscopy (pages 1-96) analysis. The results for this analysis are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.
Ken Campbell
Project Manager

KDC/hc
Enclosure: Report

0307148

Bechtel Nevada

ANALYTICAL LABORATORY
SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502
Charge Number: 51103L250
Project Manager: Jeffrey Smith
Phone: 702-295-7718 | Fax: 702-295-7761 | M/S: NT330

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon
Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NT330
Turnaround: ☐ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☒ Rush Preliminary by: _____ (IH)
☐1 ☐2 ☐7 ☐14 (non-Rad Env)
☐1 ☐7 ☒14 ☐28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358
The samples submitted contain (check);
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☑ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) _____ (Non-Rad Env) V2028 (Rad Env)
Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No
Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A
If not, identify the variation: _____
Subcontract Lab(s) used for this work: PARAGON

Pay Item, Analysis, Method

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	NGS-A-002 Gamma Spectroscopy
032233-1 (1)	7/22/03	10:30	Soil	1	500mL					X
LAST ITEM										

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Kevin B. Campbell	Kevin B. Campbell	7/23/03 0929	JERRY DUGAS	Jerry J. Dugas	7/23/03 0929
for J. DUGAS	CA Castaneda	7/23/03@1300	Fed Ex	791637702282	7/23/03@1300
Fed Ex			Jason C Kaufman	Jason C Kaufman	7/24/03@0940

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Paragon Analytics, Inc.

Radiochemistry Case Narrative
Gamma Spectroscopy

Bechtel Nevada
CAU 358 / V2028

Paragon Work Order 0307148

1. This report consists of analysis results for one soil sample received by Paragon on 7/24/03. The analysis results for this sample are reported on a 'dry weight' basis in units of pCi/gram.
2. This sample was prepared according to Paragon Analytics, Inc. procedure PAI SOP739R6.
3. The sample was analyzed for the presence of gamma emitting radionuclides according to Paragon Analytics, Inc. procedure PAI SOP713R8. The analyses were completed on 7/28/03.
4. The samples were analyzed using Seeker Version 2.2, which is a product of Vertechs Software Solutions, Inc.
5. Sample volume was insufficient to allow preparation of a duplicate. A duplicate analysis of sample 032233-1 (PAI ID 0307148-1) was performed in lieu of a preparation duplicate.
6. Due to current software limitations, the DER determinations in this report were calculated using the 2 sigma TPU. The SOW indicates that the 1 sigma TPU be used in the DER determination. However, the requested DER limit of less than 3 at the 1 sigma level (which is equivalent to 1.5 at the 2 sigma level) was achieved. Data quality is not affected.
7. Activity concentrations above the calculated MDC are reported in some instances where minimum nuclide identification criteria are not met. Such tentative identifications result when the software attempts to calculate net activity concentrations for analytes where either one or both of the following criteria are not satisfied: the 'diagnostic' peak for a nuclide must be identified above critical level (generally the most abundant, interference-free photopeak), or the minimum library peak tolerance of 75% must be attained. These data have been flagged with a "TI" qualifier.
8. No problems were encountered with either the client samples or the associated quality control samples. All quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Radiochemistry Instrument Technician — Date: 7-29-03

Radiochemistry Final Data Review — Date: 7-30-03

PARAGON ANALYTICS, INC.
Radiochemistry Data Package

3

Section 3

INDIVIDUAL SAMPLE RESULTS

Gamma Spectroscopy Results

Method PAI 713R8

Sample Results

Reported on: Tuesday, July 29, 2003 16:40:50

Client Name: Bechtel Nevada
Client Project Name: CAU 358
Client Project Number: V2028

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 0307148

Field ID: 032233-1
Lab ID: 0307148-1

Sample Matrix: Soil
Date Prepared: 28-Jul-03
Prep SOP: PAI 739R6
Prep Batch: GS02174

Date Collected: 22-Jul-03
Date Analyzed: 28-Jul-03
Analytical SOP: PAI 713R8
Spectrum Code: 031126D01A

Final Aliquot: 479.3 g
Report Basis: Dry Weight
Count Time (min.): 30
Library: LNG_GAM-A-00

Target Nuclide	Result +/- 2 s TPU	MDC	Reporting Units	Lab Qualifier
Ac-228	1.16E+00 +/- 2.66E-01	3.22E-01	pCi/g	
Am-241	-1.08E-01 +/- 2.00E-01	3.53E-01	pCi/g	U
Bi-212	1.37E+00 +/- 6.91E-01	9.67E-01	pCi/g	
Bi-214	6.55E-01 +/- 1.66E-01	1.77E-01	pCi/g	
Ce-144	-1.61E-01 +/- 2.45E-01	4.31E-01	pCi/g	U
Co-60	-1.37E-02 +/- 4.49E-02	8.17E-02	pCi/g	U
Cs-134	1.29E-01 +/- 3.34E-01	5.51E-01	pCi/g	U
Cs-137	2.39E-02 +/- 4.57E-02	7.65E-02	pCi/g	U
Eu-152	2.47E-02 +/- 2.12E-01	3.73E-01	pCi/g	U
Eu-154	-1.68E-02 +/- 2.34E-01	4.15E-01	pCi/g	U
Eu-155	1.00E-01 +/- 1.47E-01	2.41E-01	pCi/g	U
K-40	1.86E+01 +/- 3.35E+00	9.93E-01	pCi/g	
Pb-212	1.30E+00 +/- 2.50E-01	1.46E-01	pCi/g	
Pb-214	8.50E-01 +/- 1.78E-01	1.55E-01	pCi/g	
Pm-144	-7.67E-03 +/- 4.28E-02	7.53E-02	pCi/g	U
Pm-146	3.26E-02 +/- 4.98E-02	8.23E-02	pCi/g	U
Ru-106	-1.89E-01 +/- 3.88E-01	6.95E-01	pCi/g	U
Sb-125	-3.11E-02 +/- 1.06E-01	1.87E-01	pCi/g	U
Th-234	1.80E+00 +/- 9.81E-01	1.48E+00	pCi/g	TI
Tl-208	3.94E-01 +/- 9.19E-02	7.42E-02	pCi/g	
U-235	-7.97E-02 +/- 2.55E-01	4.42E-01	pCi/g	U
Y-88	2.48E-02 +/- 4.68E-02	7.84E-02	pCi/g	U

Data Package ID: *GSS0307148-1*

Gamma Spectroscopy Results

Method PAI 713R8

Sample Results

Reported on: Tuesday, July 29, 2003 16:40:50

Client Name: Bechtel Nevada
Client Project Name: CAU 358
Client Project Number: V2028

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 0307148

Field ID: 032233-1
Lab ID: 0307148-1

Sample Matrix: Soil
Date Prepared: 28-Jul-03
Prep SOP: PAI 739R6
Prep Batch: GS02174

Date Collected: 22-Jul-03
Date Analyzed: 28-Jul-03
Analytical SOP: PAI 713R8
Spectrum Code: 031126D01A

Final Aliquot: 479.3 g
Report Basis: Dry Weight
Count Time (min.): 30
Library: LNG_GAM-A-00

Target Nuclide	Result +/- 2 s TPU	MDC	Reporting Units	Lab Qualifier

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

SQ - Spectral quality prevents accurate quantitation.

SI - Nuclide identification and/or quantitation is tentative.

TI - Nuclide identification is tentative.

R - Nuclide has exceeded 8 halflives.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: *GSS0307148-1*

Gamma Spectroscopy Results

Method PAI 713R8

Sample Duplicate Results

Reported on: Tuesday, July 29, 2003 16:40:50

Client Name: Bechtel Nevada
Client Project Name: CAU 358
Client Project Number: V2028

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 0307148

Field ID: 032233-1
Lab ID: 0307148-1-D1

Sample Matrix: Soil
Date Prepared: 28-Jul-03
Prep SOP: PAI 739R6
Prep Batch: GS02174

Date Collected: 22-Jul-03
Date Analyzed: 28-Jul-03
Analytical SOP: PAI 713R8
Spectrum Code: 031047D08A

Final Aliquot: 479.3
Aliquot Units: g
Report Basis: Dry Weight
Count Time (min.): 30

Target Nuclide	Result +/- 2 s TPU	MDC	Reporting Units	Lab Qualifier
Ac-228	1.36E+00 +/- 3.38E-01	3.61E-01	pCi/g	
Am-241	7.10E-02 +/- 9.87E-02	1.62E-01	pCi/g	U
Bi-214	8.12E-01 +/- 2.36E-01	2.19E-01	pCi/g	
Ce-144	1.52E-01 +/- 2.85E-01	4.77E-01	pCi/g	U
Co-60	-3.11E-02 +/- 5.16E-02	1.13E-01	pCi/g	U
Cs-134	-4.05E-02 +/- 5.35E-02	1.05E-01	pCi/g	U
Cs-137	1.91E-02 +/- 5.86E-02	1.03E-01	pCi/g	U
Eu-152	2.17E-01 +/- 3.11E-01	5.16E-01	pCi/g	U
Eu-154	-8.23E-02 +/- 3.25E-01	6.31E-01	pCi/g	U
Eu-155	9.13E-02 +/- 1.53E-01	2.54E-01	pCi/g	U
K-40	1.84E+01 +/- 3.72E+00	8.39E-01	pCi/g	
Pb-212	1.55E+00 +/- 3.10E-01	1.48E-01	pCi/g	
Pb-214	8.60E-01 +/- 2.04E-01	1.94E-01	pCi/g	
Pm-144	-1.41E-02 +/- 6.19E-02	1.15E-01	pCi/g	U
Pm-146	2.41E-02 +/- 6.14E-02	1.06E-01	pCi/g	U
Ru-106	6.91E-02 +/- 5.17E-01	9.28E-01	pCi/g	U
Sb-125	1.56E-01 +/- 1.20E-01	2.02E-01	pCi/g	U
Th-234	1.29E+00 +/- 7.53E-01	1.12E+00	pCi/g	TI
Tl-208	4.87E-01 +/- 1.31E-01	1.13E-01	pCi/g	
U-235	2.85E-01 +/- 3.08E-01	4.96E-01	pCi/g	U
Y-88	-1.00E-02 +/- 5.50E-02	1.07E-01	pCi/g	U

Data Package ID: *GSS0307148-1*

Gamma Spectroscopy Results

Method PAI 713R8

Sample Duplicate Results

Reported on: Tuesday, July 29, 2003 16:40:51

Client Name: Bechtel Nevada
Client Project Name: CAU 358
Client Project Number: V2028

Laboratory Name: Paragon Analytics, Inc.
PAI Work Order: 0307148

Field ID: 032233-1
Lab ID: 0307148-1-D1

Sample Matrix: Soil
Date Prepared: 28-Jul-03
Prep SOP: PAI 739R6
Prep Batch: GS02174

Date Collected: 22-Jul-03
Date Analyzed: 28-Jul-03
Analytical SOP: PAI 713R8
Spectrum Code: 031047D08A

Final Aliquot: 479.3
Aliquot Units: g
Report Basis: Dry Weight
Count Time (min.): 30

Target Nuclide	Result +/- 2 s TPU	MDC	Reporting Units	Lab Qualifier

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
* - Duplicate DER not within control limits.
LT - Result is less than Requested MDC, greater than sample specific MDC.
SQ - Spectral quality prevents accurate quantitation.
SI - Nuclide identification and/or quantitation is tentative.
TI - Nuclide identification is tentative.
R - Nuclide has exceeded 8 halflives.

Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)
MDC - Minimum Detectable Concentration (see PAI SOP 709)

Data Package ID: *GSS0307148-1*

SAMPLE DELIVERY GROUP

V2026

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LIONVILLE LABORATORY INC.

13 August 2003

Mr. Theodore Redding
Bechtel Nevada Corporation
2621 Losee Road
Mail Stop NTS273
Las Vegas, NV 89030-4134

RE: Subcontract No. 30028, Task Order No. 1
Data Report for LVL Batch 0307L896
SDG#: V2026 Chain: CAU 358

Dear Mr. Redding:

Enclosed please find the data report for 16 soil samples received 22 July 2003 for analysis for TPH GRO/DRO/ORO and SVOCs on a 28 day turnaround time. The invoice is enclosed. An EDD is not required.

Please do not hesitate to contact me at (610) 280-3029 with any questions or at any time we may be of service.

Very truly yours,

Lionville Laboratory Incorporated

Judith L. Stone
Senior Project Manager

Enclosure:

Bechtel Nevada

ANALYTICAL LABORATORY
SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 2

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502
Charge Number: 5H03L E50
Project Manager: Jeffrey Smith
Phone: 702-295-7706 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon
Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306
Turnaround: ☑ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☐ Rush Preliminary by: _____ (IH)
☐ 1 ☐ 2 ☐ 7 ☐ 14 (non-Rad Env)
☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358
The samples submitted contain (check);
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☑ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2026 (Non-Rad Env) _____ (Rad Env)
Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No
Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A
If not, identify the variation: _____
Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 10.52 / TPH full scan 8015	Pay Item, Analysis, Method: 7.2 / SVOC 8270
039904-V1	7/17/03	10:00	Soil	2	250mL per container					X	X
039904-V2		10:07		2						X	X
039904-V3		10:11		2						X	X
039904-V4		10:14		2						X	X
039904-V5		10:20		2						X	X
039904-V6		10:27		2			✓	✓	(MS/MSD SVOC ONLY)	X	X
039904-V7		9:05		2						X	X
039904-V0		9:07		2						X	X
039904-V8		11:07		2						X	X
039904-V9		11:11		2						X	X

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	7/21/03 2031	JERRY J. DUGAS	Jerry J. Dugas	7/21/03 0808
for J. Dugas	CA Castaneda	7/21/03 @1300	FEDEX # 790845174146,	790845174178 & 790845174180	7/21/03 @1300
FedEx		7-22-03 0935	VICTOR HERNANDEZ		7-22-03 @ 0930

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST & CHAIN OF CUSTODY RECORD

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502

Charge Number: 5H03LE50

Project Manager: Jaffrey Smith

Phone: 702-295-7780 | Fax: 702-295-7761 | M/S: NO5306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon

Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NO5306

Turnaround: ☑ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☐ Rush Preliminary by: _____ (IH)
☐ 1 ☐ 2 ☐ 7 ☐ 14 (non-Rad Env)
☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358

The samples submitted contain (check);
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☑ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2026 (Non-Rad Env) _____ (Rad Env)

Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No

Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A

If not, identify the variation: _____

Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 10.52 TPH fullscan 8015	7.2 SVOA 8270						
039904-V10	7/17/03	11:15	Soil	2	250mL per container					X	X						
039904-V11	↓	11:20	↓	2	↓					X	X						
039904-V12		11:24		2						X	X						
039904-V13		11:29		2						X	X						
039904-V14		11:34		2						X	X						
039904-V15	↓	11:40	↓	2	↓					X	X						
Last Item																	

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	7/21/03 808	JERRY J. DUGAS	Jerry J. Dugas	7/21/03 0808
for J. Dugas.	CM Castaneda	7/21/03@1300	Fed Ex # 790845174146,	790845174179 790845174180	7/21/03@1300
FED EX		7-22-03 0930	VICTOR HERNANDEZ		7-22-03 @ 0930

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2026
LVL #: 0307L896

W.O. #: 60052-001-001-0001-00
Date Received: 07-22-2003

GRO

Ten (10) soil samples were collected on 07-17-2003.

The samples and their associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 method 8015 for Gasoline range organics (GRO) on 07-29,30,31-2003.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
2. Samples were analyzed within required holding time.
3. The method blanks were below the reporting limit for the target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

08-09-03
Date

som\Rrgroup\data\GRO\0307-896.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

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SAMPLE DATA FOR EACH SAMPLE

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-001

Sample wt/vol: 4.97 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/29/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V2

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-002

Sample wt/vol: 4.99 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 3

Date Analyzed: 07/29/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V3

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-003

Sample wt/vol: 5.16 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 4

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V4

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-004

Sample wt/vol: 5.13 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 9

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V5

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-005

Sample wt/vol: 4.93 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 7

Date Analyzed: 07/31/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V6

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-006

Sample wt/vol: 5.18 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 3

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V7

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-007

Sample wt/vol: 4.93 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 2

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V0

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-008

Sample wt/vol: 4.84 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 2

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V8

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-009

Sample wt/vol: 4.83 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 5

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V9

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-010

Sample wt/vol: 5.22 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 3

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V10

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-011

Sample wt/vol: 4.95 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 4

Date Analyzed: 07/30/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V11

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-012

Sample wt/vol: 5.01 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/31/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V12

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-013

Sample wt/vol: 4.91 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/31/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	33	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V13

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-014

Sample wt/vol: 5.12 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/31/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V14

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-015

Sample wt/vol: 5.20 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/31/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

039904-V15

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-016

Sample wt/vol: 5.15 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 5

Date Analyzed: 07/31/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2026
LVL #: 0307L896

W.O. #: 60052-001-001-0001-00
Date Received: 07-22-2003

DIESEL RANGE ORGANICS

Sixteen (16) soil samples were collected on 07-17-2003.

The samples and their associated QC samples were extracted on 07-24-2003 and analyzed according to Lionville Laboratory OPs on 07-26,27-2003. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B for Diesel Range Petroleum Hydrocarbons.

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. The required holding time for extraction and analysis has been met.

3. The method blank was below the reporting limits for all target compounds.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recovery was within acceptance criteria.

6. The matrix spike recoveries were within acceptance criteria.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/5/03
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. .

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., *10U*).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = *Indicates matrix spike.*

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

SAMPLE DATA FOR EACH SAMPLE

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-001

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.8	U
00-00-0000	Motor Oil	12.8	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V2

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-002

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

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ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V3

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-003

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 4

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V4

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-004

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 9

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	13.1	U
00-00-0000	Motor Oil	13.1	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V5

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-005

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 7

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.9	U
00-00-0000	Motor Oil	12.9	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V6

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-006

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 3

Date Analyzed: 07/26/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V7

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-007

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 2

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.3	U
00-00-0000	Motor Oil	12.3	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V0

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-008

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 2

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.3	U
00-00-0000	Motor Oil	12.3	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V8

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-009

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 5

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.6	U
00-00-0000	Motor Oil	12.6	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V9

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-010

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 3

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) mg/kg

CAS NO.	COMPOUND		
68334-30-5	Diesel Range Organics	12.4	U
00-00-0000	Motor Oil	12.4	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V10

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-011

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 4

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.5	U
00-00-0000	Motor Oil	12.5	U

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ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V11

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-012

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.7	U
00-00-0000	Motor Oil	12.7	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V12

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-013

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.8	U
00-00-0000	Motor Oil	12.8	U

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ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V13

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-014

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.8	U
00-00-0000	Motor Oil	12.8	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V14

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-015

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 6

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.7	U
00-00-0000	Motor Oil	12.7	U

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

039904-V15

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: SOIL

Lab Sample ID: 0307L896-016

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: not dec. 5

Date Analyzed: 07/27/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.7	U
00-00-0000	Motor Oil	12.7	U

12/88 Rev.

Case Narrative

LIONVILLE LABORATORY INC.

Client: BECHTEL-NEVADA V2026
LVL #: 0307L896

W.O. #: 60052-001-001-0001-00
Date Received: 07-22-2003

SEMIVOLATILE

Sixteen (16) soil samples were collected on 07-17-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on methods 3550 on 07-28-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 07-29,31-2003 and 08-06,07-2003.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. Samples were extracted and analyzed within required holding time.

3. Non-target compounds were not reported as per client request.

4. All surrogate recoveries were within EPA QC limits.

5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. The method blank contained the common laboratory contaminants Bis (2-Ethylhexyl) phthalate and Di-n-butylphthalate at levels less than the CRQL.

8. Internal standard area and retention time criteria were met.

9. Manual integrations are performed according to OP L-QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

J. Michael Taylor
President
Lionville Laboratory Incorporated

08-13-03
Date

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GLOSSARY OF BNA DATA

DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS	=	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.
BSD	=	Indicates blank spike duplicate.
MS	=	Indicates matrix spike.
MSD	=	Indicates matrix spike duplicate.
DL	=	Suffix added to sample number to indicate that results are from a diluted analysis.
NA	=	Not Applicable.
DF	=	Dilution Factor.
NR	=	Not Required.
SP, Z	=	Indicates Spiked Compound.

Sample Data for each Sample

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080517

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-n-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	890	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	890	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	890	U
83-32-9	Acenaphthene	360	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V1

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080517

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	890	U
100-02-7	4-Nitrophenol	890	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	890	U
534-52-1	4,6-Dinitro-2-methylphenol	890	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	890	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	30	JB
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)phthalate	45	JB
117-84-0	Di-n-octyl phthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenz(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V2

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-002

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080518

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 3 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V2

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-002

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080518

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 3 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	860	U
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	35	JB
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V3

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-003

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080603

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotcluene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V3

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-003

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080603

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	860	U
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	130	JB
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V4

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-004

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080604

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 9 decanted: (Y/N)__

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: _____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-n-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	910	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	910	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	910	U
83-32-9	Acenaphthene	360	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V4

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-004

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080604

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 9 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	910	U
100-02-7	4-Nitrophenol	910	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	910	U
534-52-1	4,6-Dinitro-2-methylphenol	910	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	910	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)phthalate	22	JB
117-84-0	Di-n-octyl phthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenz(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V5

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-005

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080605

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 7 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-n-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	900	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	900	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	900	U
83-32-9	Acenaphthene	360	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V5

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-005

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080605

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 7 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	900	U
100-02-7	4-Nitrophenol	900	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	900	U
534-52-1	4,6-Dinitro-2-methylphenol	900	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	900	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	37	JB
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)phthalate	65	JB
117-84-0	Di-n-octyl phthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenz(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V6

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-006

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080606

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 3 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0 (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V6

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-006

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080606

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 3 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	860	U
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	24	JB
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V7

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-007

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080609

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 2 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-di-n-propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	340	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V7

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-007

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080609

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 2 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	850	U
100-02-7	4-Nitrophenol	850	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	850	U
85-01-8	Phenanthrene	33	J
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-butylphthalate	100	JB
206-44-0	Fluoranthene	58	J
129-00-0	Pyrene	44	J
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)anthracene	19	J
218-01-9	Chrysene	29	J
117-81-7	bis(2-Ethylhexyl)phthalate	21	JB
117-84-0	Di-n-octyl phthalate	340	U
205-99-2	Benzo(b)fluoranthene	35	J
207-08-9	Benzo(k)fluoranthene	26	J
50-32-8	Benzo(a)pyrene	22	J
193-39-5	Indeno(1,2,3-cd)pyrene	21	J
53-70-3	Dibenz(a,h)anthracene	340	U
191-24-2	Benzo(g,h,i)perylene	25	J

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V0

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-008

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080610

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 2 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-di-n-propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	850	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	340	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V0

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-008

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080610

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 2 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	850	U
100-02-7	4-Nitrophenol	850	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	850	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-butylphthalate	29	JB
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)phthalate	340	U
117-84-0	Di-n-octyl phthalate	340	U
205-99-2	Benzo(b)fluoranthene	17	J
207-08-9	Benzo(k)fluoranthene	340	U
50-32-8	Benzo(a)pyrene	340	U
193-39-5	Indeno(1,2,3-cd)pyrene	340	U
53-70-3	Dibenz(a,h)anthracene	340	U
191-24-2	Benzo(g,h,i)perylene	340	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V8

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-009

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080611

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 5 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V8

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-009

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080611

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 5 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	880	U
100-02-7	4-Nitrophenol	880	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	880	U
534-52-1	4,6-Dinitro-2-methylphenol	880	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	880	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	18	JB
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	34	JB
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V9

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-010

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080612

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 3 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-di-n-propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
111-91-1	bis(2-Chloroethoxy)methane	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	860	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	860	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	860	U
83-32-9	Acenaphthene	340	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V9

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-010

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080612

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 3 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/06/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	860	U
100-02-7	4-Nitrophenol	860	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	860	U
534-52-1	4,6-Dinitro-2-methylphenol	860	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	860	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-butylphthalate	340	U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	U
56-55-3	Benzo(a)anthracene	340	U
218-01-9	Chrysene	340	U
117-81-7	bis(2-Ethylhexyl)phthalate	35	JB
117-84-0	Di-n-octyl phthalate	340	U
205-99-2	Benzo(b)fluoranthene	340	U
207-08-9	Benzo(k)fluoranthene	340	U
50-32-8	Benzo(a)pyrene	340	U
193-39-5	Indeno(1,2,3-cd)pyrene	340	U
53-70-3	Dibenz(a,h)anthracene	340	U
191-24-2	Benzo(g,h,i)perylene	340	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V10

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-011

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080708

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	870	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	870	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	870	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V10

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-011

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080708

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 4 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	870	U
100-02-7	4-Nitrophenol	870	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	870	U
534-52-1	4,6-Dinitro-2-methylphenol	870	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	870	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	350	U
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V11

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-012

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080709

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V11

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-012

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080709

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	880	U
100-02-7	4-Nitrophenol	880	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	880	U
534-52-1	4,6-Dinitro-2-methylphenol	880	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	880	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	350	U
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V12

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-013

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080710

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-n-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	890	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	890	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	890	U
83-32-9	Acenaphthene	360	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V12

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-013

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080710

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	890	U
100-02-7	4-Nitrophenol	890	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	890	U
534-52-1	4,6-Dinitro-2-methylphenol	890	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	890	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)phthalate	360	U
117-84-0	Di-n-octyl phthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenz(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V13

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-014

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080711

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	360	U
111-44-4	bis(2-Chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
541-73-1	1,3-Dichlorobenzene	360	U
106-46-7	1,4-Dichlorobenzene	360	U
95-50-1	1,2-Dichlorobenzene	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-n-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	bis(2-Chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
120-82-1	1,2,4-Trichlorobenzene	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	890	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	890	U
131-11-3	Dimethylphthalate	360	U
208-96-8	Acenaphthylene	360	U
606-20-2	2,6-Dinitrotoluene	360	U
99-09-2	3-Nitroaniline	890	U
83-32-9	Acenaphthene	360	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V13

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-014

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080711

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	890	U
100-02-7	4-Nitrophenol	890	U
132-64-9	Dibenzofuran	360	U
121-14-2	2,4-Dinitrotoluene	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	890	U
534-52-1	4,6-Dinitro-2-methylphenol	890	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
87-86-5	Pentachlorophenol	890	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-81-7	bis(2-Ethylhexyl)phthalate	67	JB
117-84-0	Di-n-octyl phthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenz(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V14

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-015

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080712

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V14

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-015

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080712

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 6 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	880	U
100-02-7	4-Nitrophenol	880	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	880	U
534-52-1	4,6-Dinitro-2-methylphenol	880	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	880	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	21	JB
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V15

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-016

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080713

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 5 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	880	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	880	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	880	U
83-32-9	Acenaphthene	350	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

039904-V15

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2026

Matrix: (soil/water) SOIL

Lab Sample ID: 0307L896-016

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: D080713

Level: (low/med) LOW

Date Received: 07/22/03

% Moisture: 5 decanted: (Y/N)

Date Extracted: 07/28/03

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 08/07/03

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	880	U
100-02-7	4-Nitrophenol	880	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	880	U
534-52-1	4,6-Dinitro-2-methylphenol	880	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	880	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	350	U
117-84-0	Di-n-octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenz(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

SAMPLE DELIVERY GROUP

V2014

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LIONVILLE LABORATORY INC.

29 July 2003

Mr. Theodore Redding
Bechtel Nevada Corporation
2621 Losee Road
Mail Stop NTS273
Las Vegas, NV 89030-4134

RE: Subcontract No. 30028, Task Order No. 1
Data Report for LVL Batch 0307L771
SDG#: V2014 Chain: CAU 358

Dear Mr. Redding:

Enclosed please find the data report for 6 soil samples received 10 July 2003 for analysis for metals and TPH GRO/DRO/ORO on a 28 day turnaround time. The invoice is enclosed. An EDD is not required.

Please do not hesitate to contact me at (610) 280-3029 with any questions or at any time we may be of service.

Very truly yours,

Lionville Laboratory Incorporated

Judith L. Stone
Senior Project Manager

Enclosure:

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 2

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502

Charge Number: SH03LZ50

Project Manager: Jeffrey Smith

Phone: 702-295-7776 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon

Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306

Turnaround: ☒ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env, ☐ Rush Preliminary by: _____ (IH)

☐ 1 ☐ 2 ☐ 7 ☐ 14 (non-Rad Env)

☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358

The samples submitted contain (check);

☐ Hazardous *(list)* - _____

☐ Radioactive *(list)* - _____

☑ Unknown contamination.

If known, identify contaminants.

This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2014 (Non-Rad Env) _____ (Rad Env)

Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No

Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A

If not, identify the variation: _____

Subcontract Lab(s) used for this work: LIONVILLE

Pay Item, Analysis, Method

10.52	9.25						
TPH Full Scan (8015)	TCLP-Lead (6010)						

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs								
180901-1V	7/9/03	11:24	Soil	2	250mL each					X	X						
180901-2V	7/9/03	11:30	Soil	2	250mL each					X	X						
LAST ITEM																	

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	7/9/03 7:35	CD CASTANEDA	CD Castaneda	7/9/03 @ 0735
CD Castaneda	CD Castaneda	7/9/03@1300	Fed Ex	790342178697	7/9/03@ 1300
Fed Ex		7/10/03 0915	VICTOR HERNANDEZ		7/10/03 @ 0915

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST & CHAIN OF CUSTODY RECORD

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502

Charge Number: 5H03LZ50

Project Manager: Jeffrey Smith

Phone: 702-295-7775 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon

Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306

Turnaround: ☒ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☐ Rush Preliminary by: _____ (IH)
☐ 1 ☐ 2 ☐ 7 ☐ 14 (non-Rad Env)
☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 359

The samples submitted contain (check);
☐ Hazardous *(list)* - _____
☐ Radioactive *(list)* - _____
☑ Unknown contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2014 (Non-Rad Env) _____ (Rad Env)

Samples submitted are associated with a signed Project SOW ☑ Yes ☐ No

Analyses entered here agree with the SOW ☑ Yes ☐ No ☐ N/A

If not, identify the variation: _____

Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 9.25	TCLP - Mercury (7470)
180901-3V	7/7/03	14:40	Soil	1	250 mL						X
180901-4V	↓	14:51	↓	1	↓						X
180901-5V	↓	15:00	↓	1	↓						X
180901-0V	↓	15:04	↓	1	↓						X
LAST ITEM											

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	7/9/03 7:37	CA CASTANEDA	CA Castaneda	7/9/03 @ 0737
CA CASTANEDA	CA Castaneda	7/9/03@1340	Fed Ex *	790342178697	7/9/03 @1340
Fed Ex		7/10/03@0915			7

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Case Narrative

LIONVILLE LABORATORY INC.

Analytical Report

Client : BECHTEL NEVADA V2014
LVL# : 0307L771

W.O.# : 60052-001-001-0001-00
Date Received : 07-10-03

SW846 METALS

1. This narrative covers the analyses of 6 TCLP leachate samples.

2. The samples were prepared and analyzed in accordance with SW-846 protocol and reported with a CLP deliverable.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

6. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

7. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within method criteria.

8. All preparation/method blanks were within method criteria. Refer to form 3.

9. All ICP Interference Check Standards were within control limits. Refer to form 4.

10. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to form 7.

11. The serial dilution percent difference was within SW-846 control limits. Refer to form 9.

12. The TCLP extract from samples 180901-1V and 3V were selected for the matrix spikes (MS) for this analytical batch. The MS recoveries for all analytes in the TCLP extract were above 50% per method criteria.

13. All sample IDs were changed to accommodate the EPA naming convention which allows a maximum of 6 characters on all CLP Forms. Refer to the comments section of form 1 for the original ID.

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14. Recoveries on the Laboratory Summary Report and CLP forms will vary depending on the number of significant figures used in the recovery calculation.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

07-23-03
Date

gmb\m07-771

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

Inorganic Analysis Data Package

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

0V

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____

Lab Code: LVLI__ Case No.: V2014 SAS No.: _____ SDG No.: 0V_____

Matrix (soil/water): WATER Lab Sample ID: 0307L771-012

Level (low/med): LOW__ Date Received: 07/10/03

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead				NR
7439-97-6	Mercury	0.10	U		AV

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

180901-0V

TCLP_OF_006

FORM I - IN

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

1V

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2014 SAS No.: _____ SDG No.: 0V___
Matrix (soil/water): WATER Lab Sample ID: 0307L771-007
Level (low/med): LOW__ Date Received: 07/10/03
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P
7439-97-6	Mercury				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
180901-1V
TCLP_OF_001

FORM I - IN

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2V

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2014 SAS No.: _____ SDG No.: 0V____
Matrix (soil/water): WATER Lab Sample ID: 0307L771-008
Level (low/med): LOW__ Date Received: 07/10/03
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead	38.5	U		P
7439-97-6	Mercury				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
180901-2V
TCLP_OF_002

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

3V

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2014 SAS No.: _____ SDG No.: 0V___
Matrix (soil/water): WATER Lab Sample ID: 0307L771-009
Level (low/med): LOW__ Date Received: 07/10/03
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead				NR
7439-97-6	Mercury	0.10	U		AV

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
180901-3V
TCLP_OF_003

FORM I - IN

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

4V

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____

Lab Code: LVLI__ Case No.: V2014 SAS No.: _____ SDG No.: 0V____

Matrix (soil/water): WATER Lab Sample ID: 0307L771-010

Level (low/med): LOW__ Date Received: 07/10/03

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead				NR
7439-97-6	Mercury	0.10	U		AV

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

180901-4V

TCLP_OF_004

FORM I - IN

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

5V

Lab Name: LIONVILLE_LABORATORY_____ Contract: 60052_____
Lab Code: LVLI__ Case No.: V2014 SAS No.: _____ SDG No.: 0V___
Matrix (soil/water): WATER Lab Sample ID: 0307L771-011
Level (low/med): LOW__ Date Received: 07/10/03
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7439-92-1	Lead				NR
7439-97-6	Mercury	0.10	U		AV

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
180901-5V
TCLP_OF_005

FORM I - IN

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2014
LVL #: 0307L771

W.O. #: 60052-001-001-0001-00
Date Received: 07-10-2003

GRO

Two (2) soil samples were collected on 07-08-2003.

The samples and their associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 method 8015 for Gasoline range organics (GRO) on 07-14-2003.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.

2. Samples were analyzed within required holding time.

3. The method blank was below the reporting limit for the target compound.

4. All surrogate recoveries were within acceptance criteria.

5. The blank spike recoveries were within acceptance criteria.

6. All initial calibrations associated with this data set were within acceptance criteria.

7. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/24/03
Date

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GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., *10U*).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as *3J*.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF GASOLINE RANGE ORGANICS DATA

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

R:/SHARE/GCVOLATILE/GCVOLATILEGLOS.DOC

SAMPLE DATA FOR EACH SAMPLE

GC VOLATILES SHEET

CLIENT SAMPLE NO.

180901-1V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2014

Matrix: SOIL

Lab Sample ID: 0307L771-001

Sample wt/vol: 4.97 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/10/03

% Moisture: not dec. 0

Date Analyzed: 07/14/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

GC VOLATILES SHEET

CLIENT SAMPLE NO.

180901-2V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2014

Matrix: SOIL

Lab Sample ID: 0307L771-002

Sample wt/vol: 4.87 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/10/03

% Moisture: not dec. 0

Date Analyzed: 07/14/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	
86290-81-5	Gasoline Range Organics (GRO)	30	U

12/88 Rev.

CASE NARRATIVE

LIONVILLE LABORATORY INC.

Analytical Report

Client: BECHTEL-NEVADA V2014
LVL #: 0307L771

W.O. #: 60052-001-001-0001-00
Date Received: 07-10-03

DIESEL RANGE ORGANICS

The set of samples consisted of two (2) soil samples collected on 07-08-03.

The samples and their associated QC samples were extracted on 07-15-03 and analyzed according to Lionville Laboratory OPs on 07-25-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8015B for Diesel Range Petroleum Hydrocarbons.

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. The blank spike recovery was within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

7/29/03
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage

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GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF DIESEL RANGE ORGANICS DATA

D	=	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
C	=	This flag applies to a compound that has been confirmed by GC/MS.

SAMPLE DATA FOR EACH SAMPLE

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

180901-1V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2014

Matrix: SOIL

Lab Sample ID: 0307L771-001

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/10/03

% Moisture: not dec. 0

Date Analyzed: 07/25/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.1	U
00-00-0000	Motor Oil	21	

12/88 Rev.

ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

180901-2V

Lab Name: Lionville Labs, Inc. Work Order: 60052001001

Client: BECHTEL NEVADA V2014

Matrix: SOIL

Lab Sample ID: 0307L771-002

Sample wt/vol: 25.0 (g/mL) G

Lab File ID: BLKLACHJ

Level: (low/med) LOW

Date Received: 07/10/03

% Moisture: not dec. 0

Date Analyzed: 07/25/03

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) mg/kg	
68334-30-5	Diesel Range Organics	12.0	U
00-00-0000	Motor Oil	17	

12/88 Rev.

SAMPLE DELIVERY GROUP

V2050

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LIONVILLE LABORATORY INC.

4 September 2003

Mr. Theodore Redding
Bechtel Nevada Corporation
2621 Losee Road
Mail Stop NTS273
Las Vegas, NV 89030-4134

RE: Subcontract No. 30028, Task Order No. 1
Data Report for LVL Batch 0308L189
SDG#: V2050 Chain: CAU 358

Dear Mr. Redding:

Enclosed please find the data report for 1 soil sample received 14 August 2003 for analysis for TCLP mercury on a 14 day turnaround time. The invoice is enclosed. An EDD is not required. These data were faxed 28 August.

Please do not hesitate to contact me at (610) 280-3029 with any questions or at any time we may be of service.

Very truly yours,

Lionville Laboratory Incorporated

Judith L. Stone
Senior Project Manager

Enclosure:

Bechtel Nevada

ANALYTICAL LABORATORY
SERVICES REQUEST & CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT/CLIENT INFORMATION

Project: CAU 358 | BN Org #: B502
Charge Number: 5H03LE50
Project Manager: Jeffrey Smith
Phone: 702-295-7775 | Fax: 702-295-7761 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Marcus Dixon
Phone: 702-295-4001 | Fax: 702-295-7761 | M/S: NTS306
Turnaround: ☐ Standard - 14 days IH, 28 days Non-rad Env, 45 Days Rad Env,
☒ Rush Preliminary by: _____ (IH)
☐ 1 ☐ 2 ☐ 7 ☒ 14 (non-Rad Env)
☐ 1 ☐ 7 ☐ 14 ☐ 28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU 358
The samples submitted contain (check);
☐ **Hazardous** *(list)* - _____
☐ **Radioactive** *(list)* - _____
☒ **Unknown** contamination.
If known, identify contaminants.
This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

SDG: _____ (IH) V2050 (Non-Rad Env) _____ (Rad Env)
Samples submitted are associated with a signed Project SOW ☒ Yes ☐ No
Analyses entered here agree with the SOW ☒ Yes ☐ No ☐ N/A
If not, identify the variation: _____
Subcontract Lab(s) used for this work: LIONVILLE

ID/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres - Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: 9.25	TCLP - Mercury (7470)
180901-6V	8/12/03	14:20	Soil	1	250mL						X
Last Item											

CUSTODY TRANSFER

Sampled/Relinquished (print)	Signature	Date/Time	Received by (print)	Signature	Date/Time
Marcus Dixon	Marcus Dixon	8/13/03 7:52	CJ CASTANEDA	CJ Castaneda	8/13/03@0752
CJ Castaneda	CJ Castaneda	8/13/03@1300	Fed Ex #	791651801157	8/13/03@1300
Fed Ex	D. Smith	8.14.03/10:10	D. Smith	D. Smith	8.14.03/10:10

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

Case Narrative

LIONVILLE LABORATORY INC.

Analytical Report

Client : BECHTEL NEVADA V2050
LVL# : 0308L189

W.O.# : 60052-001-001-0001-00
Date Received : 08-14-03

SW846 METALS

1. This narrative covers the analysis of 1 TCLP leachate sample.

2. The sample was prepared and analyzed in accordance with SW-846 protocol and reported with a CLP deliverable.

3. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory and High Purity.

4. All analyses were performed within the required holding times.

5. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.

6. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

7. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within method criteria.

8. All preparation/method blanks were within method criteria. Refer to form 3.

9. The laboratory control sample (LCS) was within the 80-120% control limits. Refer to form 7.

10. The TCLP extract from sample 180901-6V was selected for the matrix spike (MS) for this analytical batch. The MS recovery in the TCLP extract was above 50% per method criteria.

11. All sample IDs were changed to accommodate the EPA naming convention which allows a maximum of 6 characters on all CLP Forms. Refer to the comments section of form 1 for the original ID.

12. Recoveries on the Laboratory Summary Report and CLP forms will vary depending on the number of significant figures used in the recovery calculation.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

09-04-03
Date

gmb\m08-189

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage.

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

B = Indicates that the parameter was between the Instrument Detection Limit (IDL) and the Contract Required Detection Limit (CRDL)

Q QUALIFIERS

E = The reported value is estimated because of the presence of interference.

M = Duplicate injection precision not met.

N = Spiked sample recovery not within control limits.

S = The reported value was determined by the Method of Standard Additions (MSA).

W = Post Digestion spike for Furnace AA analysis is out of control limits (85 -115 %), while sample absorbance is less than 50% of spike absorbance.

* = Duplicate analysis not within control limits.

+ = Correlation coefficient for the MSA is less than 0.995.

ABBREVIATIONS

PB = Method or Preparation Blank.
S = Matrix Spike.
T = Matrix Spike Duplicate.
R or D = Sample Replicate

ANALYTICAL METAL METHODS

1. Not included in the method element list.
2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
3. Flame AA.
4. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/28/03

CLIENT: BECHTEL NEVADA V2050 LVL LOT #: 0308L189

WORK ORDER: 60052-001-001-0001-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	180901-6V	Mercury, TCLP Leachate	0.18	UG/L	0.10	1.0

U.S. EPA

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

180901

Lab Name: LIONVILLE_LABORATORY Contract: 60052

Lab Code: LVLI Case No.: V2050 SAS No.: SDG No.: 180901

Matrix (soil/water): WATER Lab Sample ID: 0308L189-002

Level (low/med): LOW Date Received: 08/14/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.18			AV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

180901-6V

TCLP_OF_001

FORM I - IN

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APPENDIX D

FIELD PHOTOGRAPHS

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PHOTOGRAPH LOG

PHOTOGRAPH NUMBER	DATE	DESCRIPTION
CAS 02-99-01		
1	07/10/2003	Removing magnetite from concrete pad
2	08/04/2003	Magnetite removed from concrete pad
3	07/15/2003	Excavating hydrocarbon spill and stockpiling on concrete pad
4	08/25/2003	Hydrocarbon spill backfilled and stockpiled soil removed
CAS 03-22-33		
5	07/21/2003	Removing magnetite
6	08/25/2003	Magnetite removed; site clean closed
7	07/21/2003	Excavating buried debris
8	08/25/2003	Backfilling debris excavation
CAS 03-99-04		
9	07/16/2003	Excavating epoxy tar spills
10	08/17/2003	Epoxy tar removed; site clean closed
CAS 18-09-01		
11	07/08/2003	Bucket, pipe dope, and associated soil excavated
12	07/08/2003	Broken batteries and associated soil excavated

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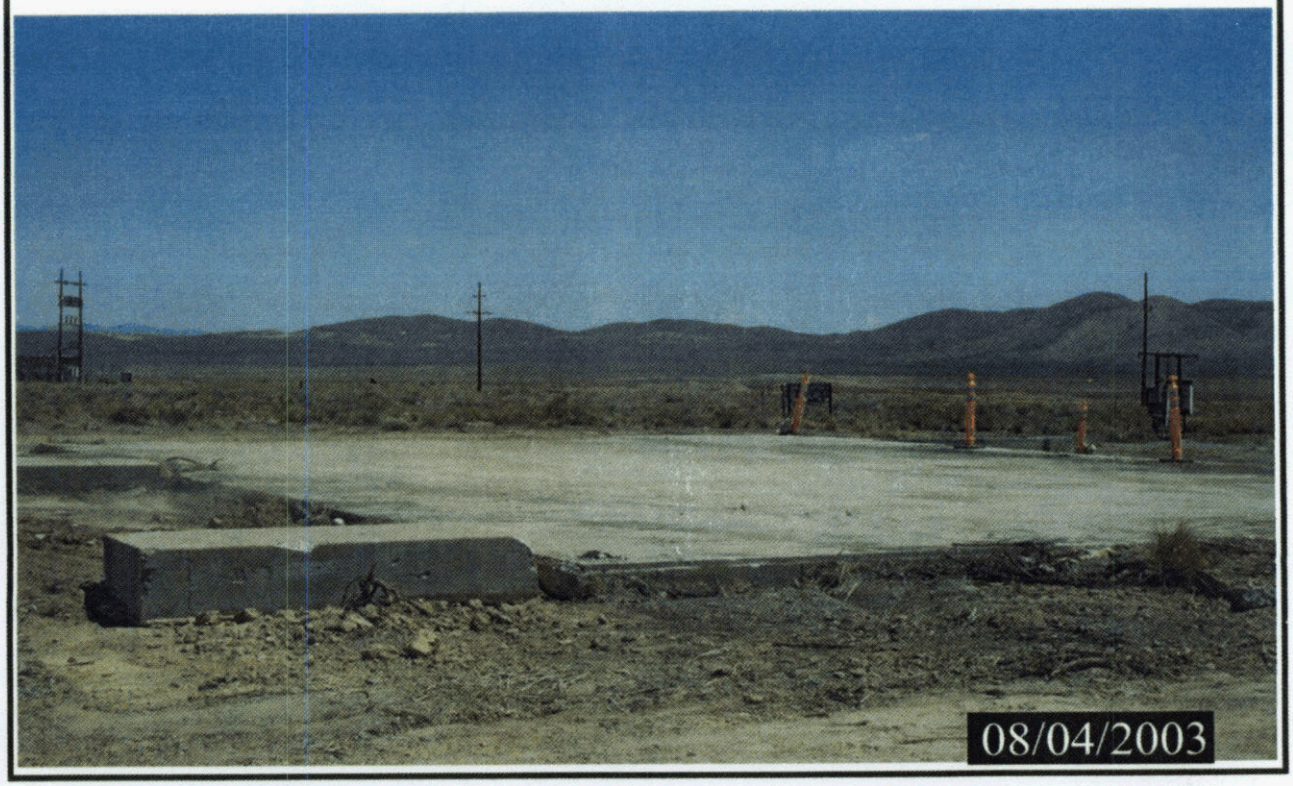
1



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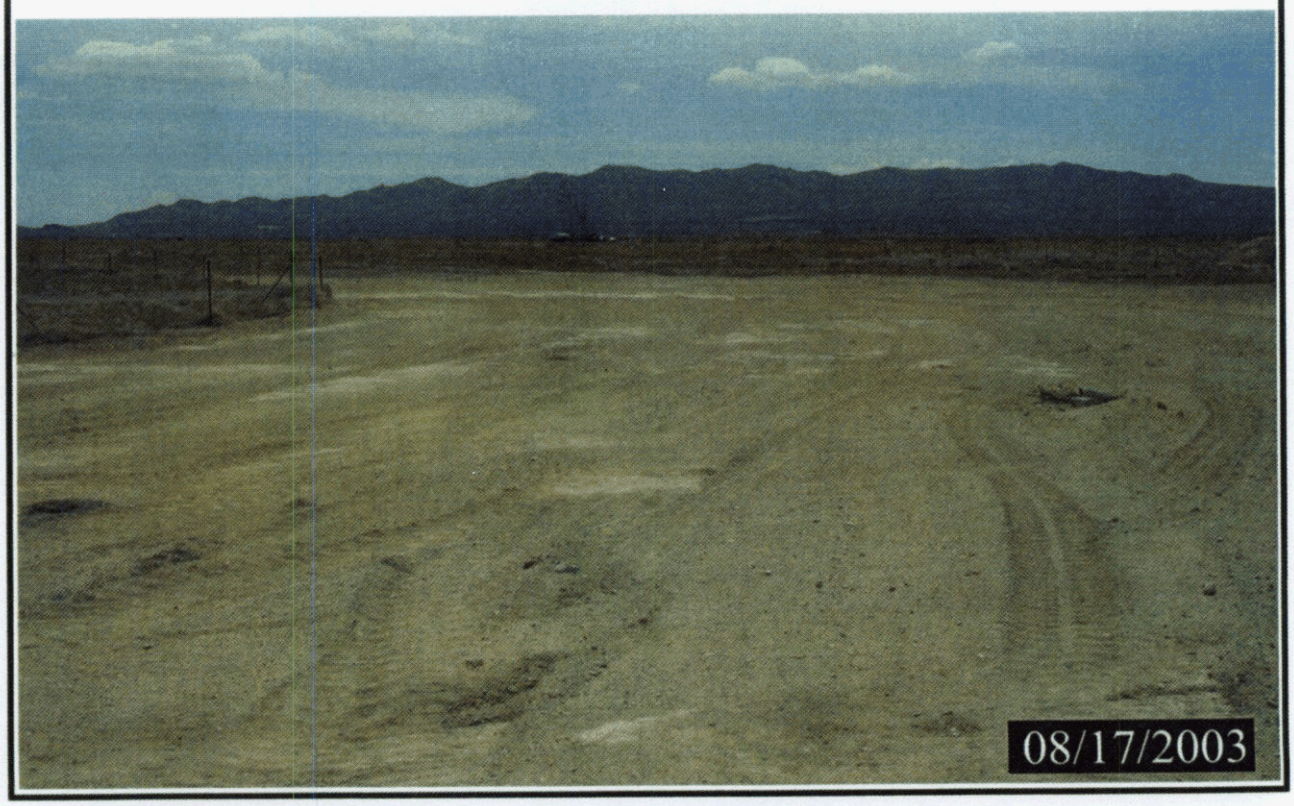

10

11

12

APPENDIX E

WASTE DISPOSITION DOCUMENTATION

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Manifest Document No.: 0 3 N 6 8

Page 1 of 1

Bechtel Nevada

Generation Date: 9/30/03

ONSITE WASTE TRANSPORT MANIFEST

1. Generator's Name, Organization, and Location: (Please Print)	2. Receiving Facility, Organization, Location: (Please Print)
BN/Environmental Restoration, B502 **NTS A-18 Ue18r Mudpit, SAA #NTS0125** **Marcus Dixon** Generator's Phone: ( ) 5-4001	**BN Hazardous Waste Operations, A497** **Hazardous Waste Storage Unit** **NTS A-5 Bldg. 5-20** Facility Phone: ( ) 5-7669

3a. Transporter Name: (Please Print)	Transport Date:	3b. Vehicle I.D. Number:
	9/30/03	

	4. U.S. D.O.T. Description. Include: EPA Waste Code and Package Identification Numbers.	HM	5. Containers No.	5. Containers Type	6. Total Quantity	7. Unit Wt./Vol.
a	*Hazardous waste, solid, n.o.s. (lead), 9, NA3077, PG-III* D008 #BN-NTS-03-0420	X	1	DM	20 273	G P
b						
c						
d						
e						
f						
g						

Use continuation pages for additional items, as necessary.

8. Special Handling Instructions and Additional Information: 24 Hour emergency contact: 702 - 295-0311 / Secondary: Troy Belka 5-3505 (Name & phone no.)

a. ERG #171. 5-G bucket of pipe dope with associated spill cleanup material.

9. Released by: (Signature) Marcus Dixon	Date: 9/30/03
10. Received for Transport by: (Signature)	Date: 9/30/03
11. Discrepancy Indication:	
12. Disposal/Accumulation Site Signature: (Acknowledges acceptance of waste)	Date: 9/30/03

Distribution: Original Copy - HWO; Generator

Retention Code: ENV2d(2)

BN-0286 (11/02)

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Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

[redacted]

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste: Area No.	Origin Of Waste: Building No.	
AREA 9	10-SEP-2003	I	FFACO-ONSITE	EM	CLEAN-UP	00	18	CAU-358	Comments
AREA 9	25-AUG-2003	I	FFACO-ONSITE	EM	CLEAN-UP	35000	03	CAU-358	Comments
AREA 9	25-AUG-2003	I	FFACO-ONSITE	EM	CLEAN-UP	15000	03	CAU-358	Comments
AREA 6	04-AUG-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38000	02	CAU-358	Comments
AREA 6	04-AUG-2003	I	FFACO-ONSITE	EM	CLEAN-UP	39000	02	CAU-358	Comments
AREA 6	04-AUG-2003	I	FFACO-ONSITE	EM	CLEAN-UP	35000	02	CAU-358	Comments
AREA 9	24-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	34540	03	CAU-358	Comments
AREA 9	24-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	41200	03	CAU-358	Comments
AREA 9	24-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	36260	03	CAU-358	Comments
AREA 9	24-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	35200	03	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada << < > >> Query Save Exit Bechtel Nevada

Count: 57

Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

SOLID WASTE TRACKING SYSTEM

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste: Area No.	Origin Of Waste: Building No.	
AREA 9	24-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	33240	03	CAU-358	Comments
AREA 9	24-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	36300	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	42000	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	33680	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	41000	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38000	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	33600	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	40000	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	32800	03	CAU-358	Comments
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	34000	03	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada << < > >> Query Save Exit Bechtel Nevada

Count: 67

Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

SOLID WASTE TRACKING SYSTEM

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste: Area No.	Origin Of Waste: Building No.	
AREA 9	23-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38000	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	32180	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	29616	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30430	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	39000	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	43400	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	42060	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38000	03	CAU-358	Comments
AREA 9	22-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	42000	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	42120	03	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada << < > >> Query Save Exit Bechtel Nevada

Count *67 *y

Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

[redacted] WASTE TRACKING SYSTEM

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste: Area No.	Origin Of Waste: Building No.	
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	42380	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	48460	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30000	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	26340	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38100	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	29040	03	CAU-358	Comments
AREA 9	21-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	29900	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	31000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	32000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	34000	03	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada << < > >> Query Save Exit Bechtel Nevada

Count 57 ^ v

Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

[redacted]

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste: Area No.	Origin Of Waste: Building No.	
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	33000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	31000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	32000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	29000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	37000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	34000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30000	03	CAU-358	Comments
AREA 6	17-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	35000	03	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada | << | < | > | >> | Query | Save | Exit | Bechtel Nevada

Count: 67

Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

SOLID WASTE TRACKING SYSTEM

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste Area No.	Origin Of Waste Building No.	
AREA 6	16-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	20000	03	CAU-358	Comments
AREA 6	16-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30000	03	CAU-358	Comments
AREA 6	16-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	33000	03	CAU-358	Comments
AREA 6	16-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30000	03	CAU-358	Comments
AREA 6	16-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	30000	03	CAU-358	Comments
AREA 6	16-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	32000	03	CAU-358	Comments
AREA 9	14-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	20000	02	CAU-358	Comments
AREA 9	14-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	15000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	40000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	31000	02	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada << < > >> Query Save Exit Bechtel Nevada

Count: 67 ^ v

Waste Management System - [Sanitation Module]

Action Edit Block Field Record Query Window Help

SOLID WASTE TRACKING SYSTEM

Landfill ID	Date Of Receipt	Waste Category	Type Of Waste	EM or DP	Routine or Clean-up	Weight Pounds	Origin Of Waste: Area No.	Origin Of Waste: Building No.	
AREA 9	14-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	15000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	48000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	41000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	40000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	38000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	41000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	39000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	26000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	33000	02	CAU-358	Comments
AREA 9	10-JUL-2003	I	FFACO-ONSITE	EM	CLEAN-UP	10000	02	CAU-358	Comments

If you Save data, a report on records that have been changed today will be printed to your default printer when you Exit.

Bechtel Nevada << < > >> Query Save Exit Bechtel Nevada

Count: 67

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APPENDIX F

CLOSURE CERTIFICATION*

*As referenced in Section 3.1 of this Report, a Closure Certification is not applicable to the closure of CAU 358. No Closure Certification is required or necessary for closure of CAU 358.

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APPENDIX G

AS-BUILT DOCUMENTATION*

*As referenced in Section 3.1 of this report, As-Built Documentation is not applicable to the closure of CAU 358. No engineered structures were constructed during the closure of CAU 358.

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APPENDIX H

MODIFICATIONS TO THE POST-CLOSURE PLAN*

*As referenced in Section 3.1 of this report, no post-closure monitoring is required.

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APPENDIX I

NEPA ENVIRONMENTAL EVALUATION CHECKLIST

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NV-16
(Rev. 07/2002)
Other Editions Obsolete

U.S. DEPARTMENT OF ENERGY
NATIONAL NUCLEAR SECURITY ADMINISTRATION NEVADA OPERATIONS OFFICE
NEPA ENVIRONMENTAL EVALUATION CHECKLIST

FOLLOW ATTACHED PROCEDURES FOR COMPLETING CHECKLIST	Date
A. Project/Activity Title (Attach a brief description of proposed project) **CAU 358: Cellars/Mud Pits Closure/Clean Up Activities**	**May 20, 2003**
Project Location **NTS, Areas 2, 3, and 18**	Proposed By (If other than NNSA/NV)
NNSA/NV Line Management Organization **Environmental Restoration**	NNSA/NV Project/Program Manager **Janet Appenzeller-Wing/Runore Wycoff**
Anticipated Start Date **June 26, 2003**	DOE/HQ Program Office (If applicable)

ENVIRONMENTAL CONSIDERATIONS: If any phase of the project/activity involves any of the following considerations, check yes and explain in project description. See NV-16A for consideration guidelines and examples.

Consideration	Yes	No	Unk	Consideration	Yes	No	Unk
1. Noise	x			10. Liquid Effluents		x	
2. Air Emissions	x			11. Underground Storage/Septic Tanks		x	
3. Explosives		x		12. Utility Systems (PCBs)		x	
4. Petroleum/Fuel Storage/Use		x		13. Environmental Restoration Site	x		
5. Pesticide/Herbicide Use		x		14. Change in Existing Drainage Pattern		x	
6. Hazardous/Toxic Substances	x			15. Surface Disturbance/Excavation	x		
7. Solid Waste	x			16. Cultural/Historic Resources			x
8. Mixed Waste		x		17. Biological/Tortoise Resources			x
9. Radioactive Materials		x					

DO NOT TYPE OR WRITE BELOW THIS LINE. FOR ESHD USE ONLY.

B. Is the project/activity included in the final NTS EIS and the ROD or other NEPA document?
Yes ___X___ (complete Sections C, D, and E) No _____ (complete Sections D, E, and F)

C. This project/activity is included in the NTS EIS/ROD (or other NEPA document) under the following section and page number:
NTS/EIS, Volume 1, Appendix A, A-3.1.3 *Environmental Restoration Project - Industrial Sites Project*

D. Does the proposed project/activity require any local, state, or federal permits or notifications? Yes _X_ No ___

E. Does the proposed project/activity relate to the FFCA or FFACO agreements? Yes _X_ No ___

F. If, based on the project description and the preliminary environmental considerations noted above, the proposed action fits within a class of action listed in Subpart D of 10 CFR 1021, write in the space below, the paragraph number and short title from the appropriate table of contents of Subpart D, Appendix B, C, or D, for a CX, EA, or EIS. If the proposed action does not fit within any class of action, write "Not Listed" below.

G. **NEPA COMPLIANCE OFFICER DETERMINATION OR RECOMMENDATION:**
I have determined that the proposed activity as described in item A above, has been adequately addressed for the purpose of NEPA in the NTS/EIS. No further analysis or documentation is required pursuant to NEPA.

Michael G. Boogard — NNSA/NV NEPA Compliance Officer

5/21/03 — Date

CAU 358: CELLARS/MUD PITS CLOSURE/CLEAN UP ACTIVITIES

Project Description

Corrective Action Unit (CAU) 358 consists of 17 Corrective Action Sites (CAS) located in Areas 2, 3, 18, 19, and 20 of the Nevada Test Site. The purpose of this activity is to perform clean up/closure activities on four of the seventeen sites. The remaining 13 sites will be closed by implementing use restrictions or taking no further action. The table below lists the four CASs, descriptions, and closure activities.

CAS	LOCATION	CAS DESCRIPTION	CLOSURE ALTERNATIVE	COMMENTS
02-99-01	Area 2	Oil Stained Dirt on Concrete	Clean Closure	Remove magnetite from concrete pad for disposal. Excavate and dispose of hydrocarbon-impacted soil (potentially lead-impacted soil).
03-22-33	Area 3	Bucket; Spill; Debris	Clean Closure	Excavate magnetite and magnetite/soil mixture for disposal. Pick-up any debris in the area for disposal.
03-99-04	Area 3	Spill	Clean Closure	Excavate epoxy tar and associated soil for disposal.
18-09-01	Area 18	Mud Pit	Clean Closure (debris only)	Excavate/pick-up debris and associated impacted soil - containerize within an SAA awaiting disposal.

Environmental Considerations

1. Noise: Elevated noise levels may result from the operation of equipment during excavation and removal activities. Hearing protection would be provided.

2. Air emissions (CAA): There is a possibility for dust in the air during excavation/removal activities and potential exposure to contaminants during the sampling and excavation. Water sprayers (or similar) would be used as necessary to control dust.

6. Hazardous/Toxic Substances: CAS 02-99-01consists of TPH and potentially lead-impacted soil, CAS 03-99-04 consists of TPH- and SVOC- impacted soil, and CAS 18-09-01 consists of small amounts of lead- and mercury-impacted soil/material. The hazardous soil/material will either be shipped off-site for disposal soon after its generated or it will be transported to a temporary hazardous waste storage pad for eventual shipment off-site for disposal. Personnel would be required to follow the safety procedures outlined in the Site Specific Health and Safety Plan and the Job Hazard Analysis.

7. Solid Waste: Any non-hazardous solid waste that may be generated from the project activities would be disposed of a the NTS in a designated landfill.

13. Environmental Restoration Site: This project is included in the FFACO as Corrective Action Unit 358 (see project description).

15. Surface Disturbance/Excavation: Large equipment will travel off-road to access sites. Appropriate warning signs will be installed. If necessary, the excavations will be backfilled and regraded to the approximate original topography.

16. Cultural/Historic Resources: Cultural/historic surveys may be required in areas where off-road driving would occur. Surveys will be conducted as necessary prior to any off-road driving.

17. Biological/Tortoise Resources: Biological surveys may required in disturbed areas and in areas where off-road driving would occur. Surveys will be conducted as necessary prior to any off-road driving.

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APPENDIX J

NEVADA ENVIRONMENTAL RESTORATION PROJECT DOCUMENT REVIEW SHEET

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NEVADA ENVIRONMENTAL RESTORATION PROJECT
DOCUMENT REVIEW SHEET

1. Document Title/Number Draft Closure Report for Corrective Action Unit 358: Areas 18, 19, 20 Cellars/Mud Pits, Nevada Test Site, Nevada
2. Document Date November 2003
3. Revision Number 0
4. Originator/Organization Bechtel Nevada
5. Responsible NNSA/NV ERP Project Mgr. Janet Appenzeller-Wing
6. Date Comments Due December 22, 2003
7. Review Criteria Federal Facility Agreement and Consent Order
8. Reviewer/Organization/Phone No. Clem Goewert/NDEP/(702) 486-2874

9. Comment Number/ Location	10. Type[a]	11. Comment	12. Comment Response	13. Accept
1. Page 1, Section 1.1	M	Section 1.1 Purpose states "The purpose of this CR is to document that the closure of CAU 358 complied with all closure requirements as stated..." This is incorrectly stated. The sentence should state that the remedial or closure activities have met the closure standards. Closure reports only report that a site either meets or has been remediated to meet a closure standard. This same type of misstatement is made numerous times throughout the report. These types of statements need to be edited to correctly state that criteria for the specific type of closure has been met.	The sentence in Section 1.1 Purpose has been changed to read "The purpose of this CR is to document that the closure activities completed for CAU 358 met all closure standards as stated in the NDEP-approved CAU 358 SAFER Plan (NNSA/NSO, 2003)." Throughout the document statements have been edited to state that "the approved closure activities were completed...", rather than "the site was closed by..."	
2. Page 33 Section 5.2	M	Section 5.2 Recommendations should request a notice of completion for NDEP's acceptance of each type of closure being requested. A good example is Section 5.2 Recommendations in the Closure Report for CAU 523, which requests a particular type of closure.	Section 5.2 has modified to request a notice of completion for each of the 17 CASs in CAU 358 with the CASs grouped by closure type.	

[a]Comment Types: M = Mandatory, S = Suggested.

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